

MINING NORTH

AN OFFICIAL PUBLICATION OF THE NWT & NUNAVUT CHAMBER OF MINES • 2012

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Northern companies, such as the Yellowknives Dene's Deton'Cho Corp., are growing alongside the Northern mining industry. See story page 30.

COURTESY DETON'CHO CORP.



NEWSPORTAL
Diamonds continue to dominate the industry, see the numbers. **P7**

President's message

The Northwest Territories & Nunavut Chamber of Mines is bringing back Mining North – and we have a story to tell.
By Pamela Strand. **P4**

DEPARTMENTS

News Portal

Northern mining news – from green energy and new deals to new (and better) government policy. **P6**

Profiles: Faces in Mining

The Northern mining industry depends on the efforts of individuals doing many different kinds of work. Meet six of them. **P12**

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NWT Exploration Update

Recent news from producing mines and advanced exploration projects in the Northwest Territories. **P24**

NUNAVUT Exploration Update

Exploration is on the rise and Nunavut has a new place on Canada's mining map. **P28**

COVER: THE DIAVIK DIAMOND MINE OFFICIALLY OPENED IN 2003. PHOTO COURTESY DIAVIK DIAMOND MINE.

MINING NORTH

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The Future is Now

Training is the backbone of creating employment opportunities for NWT and Nunavut residents in the Northern minerals industry. And with new commitments and new strategies, mine training is going places like never before. **By Rob Coffman P34**

Taking Care of Business

Investment in mining and exploration is creating entrepreneurial booms across the North – especially in First Nation and Inuit communities, where local businesses are winning major contracts. The secret to success? Partnerships that work. **By Mifi Purvis P40**

Building More Than Mines

Mining royalty payments and revenue sharing under land claims and benefit agreements are giving aboriginal governments resources to grow. And in one case, an equity participation proposal promises to take their business acumen to a new level. **By Martin Dover P46**

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Welcome to our New Mining North Magazine

Welcome to our new release of *Mining North*, the flagship magazine of the NWT and Nunavut Chamber of Mines.

It's been some five years since we last produced *Mining North*, and our publishers at Up Here Publishing have done a great job to tell some of our great stories.

There couldn't be a better time to re-launch *Mining North*. As Prime Minister Stephen Harper said this summer during his Northern tour: "That great national dream – the development of Northern resources – no longer sleeps. It is not down the road. It is happening now. The North's time has come."

We have already seen the power of an awakening industry with the development of a global diamond mining powerhouse in the NWT. Diamonds have created so many rich and meaningful benefits for the North and our communities.

But today, Nunavut is very much awakening from its slumber. The Meadowbank mine started the process, and with the encouragement of global demand, Nunavut mining investment is now accelerating to projected record levels. One of its oldest undeveloped projects – first discovered 50 years ago – the Mary River iron project is one important step closer to providing thousands of jobs and billions of dollars in business and royalties to Nunavut. Its Arctic railway will be a huge symbol of just what's possible in a new Nunavut. The success of another eight advancing projects – hoping to mine gold, silver, copper, zinc, lead, iron, uranium and diamonds – will create meaningful opportunities in all regions of the territory, and boost Nunavut to major Canadian mining status. What a fantastic opportunity to mesh with Nunavut's growing population and future aspirations.

The NWT continues to be "on the podium" as the third most valuable diamond producer in the world, and those diamonds are the lar-

gest private sector contributor to the economy. Tungsten is adding its share. Mines don't last forever, and to help sustain our NWT industry, we have six projects that are in, or have cleared, the environmental approvals processes. We are tremendously hopeful of their success, which will add much-needed future benefits to fill in the diamond gap as mines close. That being said, we are encouraging exploration investment in the NWT to further address that reality.

What bodes well for both territories is a new and increased dialogue between industry, communities and government, one in which the NWT and Nunavut Chamber of Mines is an active player. In Nunavut, we are working cooperatively with Inuit land claim organizations and both levels of government to help smooth the path forward. In the NWT, we are helping government to advance a new NWT Mineral Development Strategy, and we have launched a cooperative collaboration with the Akaitcho Dene First Nation towards mutually beneficial mineral exploration in that rich part of the territory.

If you're already an active investor in the North, we want to take this opportunity to say thank you. If you're not, then come and check us out. We think you'll be pleasantly surprised. This issue of *Mining North* will be a good introduction.

Pamela Strand
President

What bodes well for both territories is an increasing dialogue between industry, communities and government.

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Keeping It Cool

How are Northern mines managing on greenhouse-gas emissions?

All Northern mines participate in the Mining Association of Canada's Toward Sustainable Mining (TSM) initiative, an annual reporting system that measures — and independently verifies every three years — reporting from mines on a host of environmental and social issues. Greenhouse gas emissions are among them. They are evaluated on six metrics including energy and emissions management, energy and emissions intensity performance targets, and emissions management and reporting. Here, we present a summary of greenhouse emissions report for the North's diamond mines, our largest mines, in the MAC's 2011 Towards Sustainable Mining report. Standby. The 2012 report is coming — and the results will be even better.

Diavik

TSM Category: Energy Use and GHG Emissions Management

Average score: AA

Highest Score: AAA, Energy Use Management Systems, GHG Emissions Management Systems

Toward Sustainable Mining Comment:

"Two projects are being considered that would minimize the increase of GHG emissions by reducing diesel consumption. Installing a small wind farm is one feasible option." (Diavik has completed its wind-farm project. This winter, it will begin supplying no less than eight to 10% of the mine's power needs. For more, see p14)

Ekati Mine

TSM Category: Energy Use and GHG Emissions Management

Average score: AA

Highest score: AAA, Energy Use and Reporting Systems

Towards Sustainable Mining Comment:

"BHP Billiton's commitment to the environment, demonstrated through Ekati's 'Powerwise' project, has been recognized three times at the company's global HSEC [Health, Safety, Environment and Community] Awards. Most recently, Ekati was honoured in 2010 for its support of the Global Energy Smart project, which delivered GHG emission reductions across the business."

Snap Lake

TSM Category: Energy Use and GHG Emissions Management,

Average score: B

Highest score: B, Energy Use Management Systems, Energy Use Reporting Systems, GHG Emissions Management System, GHG Emissions Reporting Systems.

Toward Sustainable Mining Comment:

"De Beers plans to develop energy and GHG emissions intensity indicators and to fully implement energy information management systems. These activities will lay the groundwork for comprehensive energy and GHG management systems as well as ongoing performance measurement." (De Beers Canada, the newest of the diamond mines, has been moving forward on its greenhouse-gas programs and has raised its scores to "A" in all categories since the last TSM report was published.)

LEGEND:

AAA: Excellence and leadership;

AA: Systems and processes integrated into management decisions and business functions;

A: Systems/processes are developed and implemented;

B: Procedures exist but are not fully documented, systems/processes are planned and being developed;

C: No systems in place, procedures may exist but are not integrated into policy or management.



Nunavut Economic Development Minister Peter Taptuna. "The government regards mining as an important potential source of revenue."

Here Are the Rules

Nunavut's government ratifies a new policy for uranium exploration and development

Twenty-two years ago, Nunavut signalled its attitude toward uranium when Baker Lake held a community plebiscite on a proposal by Urangesellschaft Canada Ltd. to develop a mine called Kiggavik to the west of the community. The vote was a resounding "no." Ninety percent of residents cast ballots against the mine, and with uranium prices at a low ebb, Urangesellschaft quietly abandoned its project.

Today, uranium is back in the spotlight in Nunavut with three companies pursuing active projects. AREVA Resources Canada Inc. has a mining proposal at the Kiggavik site that's now in the environmental-assessment process. Cameco Corp. and Kivalliq Energy Corp. also have exploration programs in the region.

Moreover, the response in Nunavut has become cautiously more welcoming. This past June, the territorial government released a uranium exploration and development policy that lays the groundwork for a balanced approach to capturing the benefits of development while recognizing the concerns.

Based on five principles, the policy says the government will support uranium projects provided that: production is used for peaceful and environmentally sustainable purposes; Nunavummiut are major beneficiaries of development; health and safety measures for workers meet national standards; environmental standards are assured, especially with regard to land, water and wildlife; and that projects are supported by Nunavummiut, with special emphasis on the communities nearest the projects.

"The government of Nunavut regards mining as an important potential source of revenue to meet the needs of Nunavut's growing population," Economic Development Minister Peter Taptuna said in presenting the policy to the territorial legislature. "[It] also recognizes that uranium exploration and mining places special responsibilities on the government because of the nature of uranium and its by-products." The development of the policy included public consultations in Baker Lake, Iqaluit and Cambridge Bay. More than 100 people made submissions during the hearings.

FAST FACT

15%

The combined output of the Northwest Territories's three diamond mines account for about 15% of world production.

The Plan Is On the Way

The GNWT has started work on a mineral development strategy



NWT Industry Minister **Dave Ramsay** marked the arrival of Mining Week this year with the announcement that the territorial government was beginning work to create a comprehensive mineral development strategy to guide future decision-making on resources.

Speaking in the legislature, Ramsay acknowledged the contribution mining and exploration have made to the NWT, calling it "the backbone of our economy." He also noted that all the progress made to date has been accomplished without an overarching framework to ensure the NWT can make the most of its resource wealth.

"Our approach to date has been to maximize the benefits of resource development by building business capacity in our communities, corporations and business," Ramsay said. "We are also investing in our youth, who will eventually guide and empower its growth. We've had success in these areas, but there needs to be a long-term plan."

Since development of the strategy is only at the earliest stages, Ramsay did not go into specifics of what it would cover. But he outlined next-steps, including the drafting of a discussion paper and a project charter to facilitate discussions >

By the Numbers: Trends in Northern Mining

Federal estimates show that Northern and national exploration spending grew in 2011 (and will continue to do so in 2012, according to spending-intention surveys.) Meanwhile, diamonds continue to dominate production — but gold in Nunavut is making some noise.

PRODUCTION

Total Value of Mineral Production in NWT and Nunavut:
\$2.6 billion



DIAMONDS: 81.2% (\$2 BILLION)



GOLD: 16% (\$412 MILLION)



TUNGSTEN: 2.4% (\$62.5 MILLION)



STONE: >1% (\$7.8 MILLION)



SILVER: >1% (\$2.5 MILLION)



SAND/GRAVEL: >1% (\$2.2 MILLION)



COPPER: >1% (\$2 MILLION)

Mineral Production in Nunavut:
\$414 million



GOLD: 99.4% (\$412 MILLION)



SILVER: 0.6% (\$2.5 MILLION)

Mineral Production in NWT:
\$2.1 billion



DIAMONDS: 95% (\$2 BILLION)



TUNGSTEN: 3% (\$62.5 MILLION)



STONE: >1% (\$7.8 MILLION)



SAND/GRAVEL: >1% (\$2.2 MILLION)



COPPER: >1% (\$2 MILLION)

WIND TURBINE: Diavik has completed the construction of a four-turbine wind farm at its mine site. Starting this year, the farm will supply between eight and 10 percent of the mine's energy needs. Photo courtesy of Diavik Diamond Mines.

EXPLORATION

Total Spending in Canada



Percentage change: 40%

Total Spending in Nunavut



Percentage change: 95%

Total Spending in NWT



Percentage change: 28%

with stakeholders ranging from industry and business to aboriginal governments, communities and NWT residents. He also said the government has budgeted \$1 million in the 2012-13 fiscal year for the development of the mineral strategy and an economic development strategy.

Nunavut has had a mineral exploration and development strategy in place for several years. It is based on four key themes, covering: the creation of legislation to govern resource development; a commitment to strategies and initiatives to ensure full participation of Nunavummiut in development; infrastructure development; and, environmental stewardship. From these principles, the strategy outlines 16 policy positions and 22 action items that deal with issues including tax policy, education, and environmental research.



Akaitcho Chiefs Ted Tsetta, Edward Sangris, Antoine Michel and Louis Balsillie, with Tom Hoefer (centre).

Delivering on Mutal Benefits

Chamber of Mines and the Akaitcho Dene leadership sign a landmark agreement to promote exploration

Resources and exploration potential may be the most important features that attract mineral investment to the North, but the certainty of the regulatory and

political environment runs a close second. The good news is that the completion of land claims in many Northern regions has built the foundations for successful relationships between companies and communities in the cooperative development of resources.

But what about areas where land claims have yet to be finalized? The NWT and Nunavut

Chamber of Mines and the Akaitcho Dene First Nations – the political organization representing the central NWT communities of Łutselk'e, Deninu Kue, N'dilo and Dettah – are taking a major step towards answering that question. They have signed a unique memorandum of understanding entitled "Collaboration Towards Mutually Beneficial Mineral Exploration and Development in the Akaitcho Territory."

Under the MOU, the two parties are now working to develop an action plan that will see the Akaitcho and Chamber of Mines building bridges towards better communications, relationships and, ultimately, more exploration spending in the Akaitcho Territory. That territory is a significant producer of wealth in the NWT, hosting the Yellowknife gold mines and the world-class

diamond mines. Rocks of the Akaitcho Territory also host rare earth metals, base and precious metals, and uranium, to name just a few.

The Akaitcho continue to build business strength around the minerals industry. They see future exploration and mining as critical to sustaining and growing their investments. With projects like Avalon Rare Metals Inc. now even promising equity participation, the Akaitcho have the very real opportunity to become miners in their own right. >

Who You Gonna Call? These Guys

Meet the winners of the 2012 NWT/Nunavut mine rescue competition

The NWT/Nunavut Annual Mine Rescue Competition celebrated its 55th anniversary this year, with six teams competing, including one from the Yukon. NWT participants came from the Snap Lake, Diavik and Ekati diamond mines, as well as the Cantung tungsten mine. Nunavut's Meadowbank gold mine and the Minto copper-gold mine in the Yukon also fielded teams. Here are the results:

Overall surface winner: Ekati (ST)*
Overall underground winner: Diavik
First Aid: Ekati (UT)
Surface Practical Bench: Minto
Fire Fighting: Meadowbank
Rope Rescue: Snap Lake
Surface Written Test: Ekati (ST)

Underground Written Test: Diavik
Surface Smoke: Ekati (ST)
Underground Smoke: Diavik
Underground Bench/Field Test: Diavik
Surface Obstacle/Extraction: Ekati (ST)
Underground Obstacle/Extraction: Snap Lake

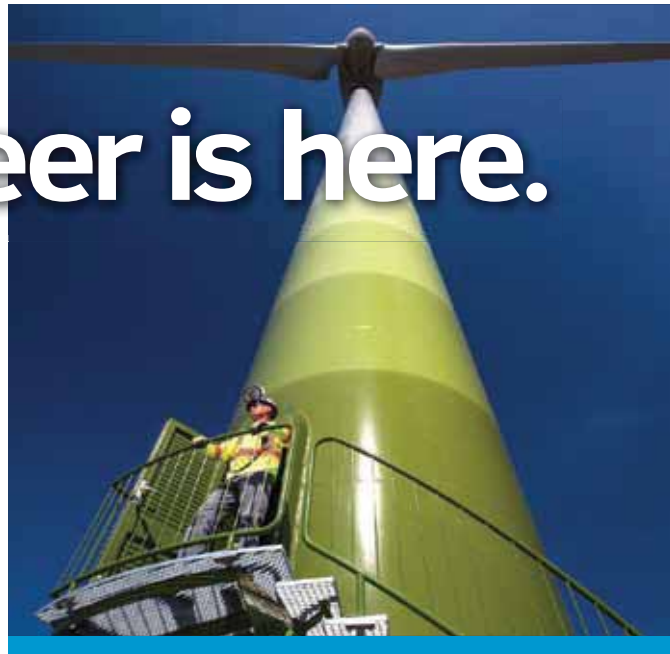
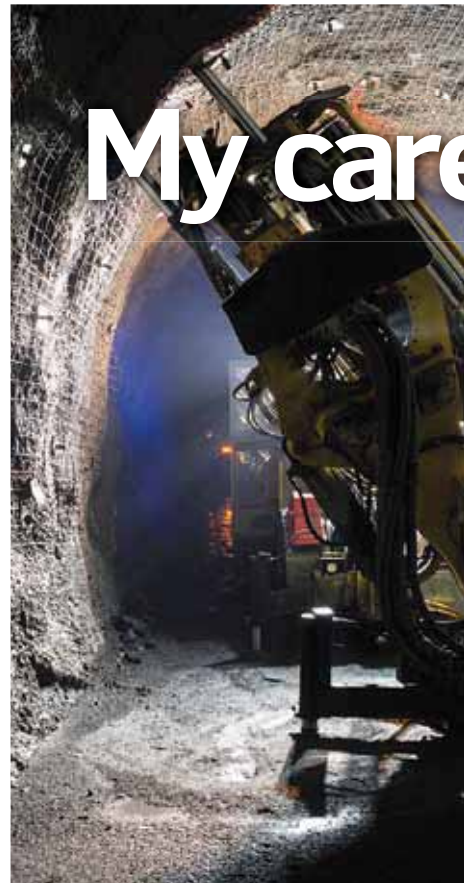
* Ekati entered two teams, one for surface events (ST) and another for underground events (UT). A special thanks goes out to this year's competition sponsors: WSCC, Rio Tinto, BHP Billiton, Levitt-Safety, Nuna Logistics, Draeger Canada and De Beers Canada.

"Because that great national dream – the development of Northern resources – no longer sleeps. It is not down the road. It is happening now. The North's time has come, my friends."

Prime Minister Stephen Harper steps up for the mining industry during his August visit to the NWT, Yukon and Nunavut.



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Stephen Ellis, a special advisor to the Akaitcho Dene, adds: "Our leadership is also quite

Since the memorandum was signed in July

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Striking the Balance

For **Joe Tigullaraq**, time on the land brings perspective to work at the office.



do in my work when I'm out hunting. I'm never completely away from work."

Even if thoughts of work are never far, Tigullaraq says his time on the land gives him the chance to reflect and expend the energy that builds up after being indoors for most of the work week. Often, he says, he finds himself examining issues from a different perspective than the one he considered at the office.

Tigullaraq, who is originally from Clyde River, began hunting "when his hair was still black" but he didn't start as early as some of the other kids of his generation. Instead, he was more focused on getting an academic education in his early years, but he does not regret waiting to develop his land skills. "It's not a negative aspect of my life but something I had to do in order to learn what I know today on the academic side," Tigullaraq says. "I think I have the best of both worlds."

Indeed, as much as he loves life on the land, he also enjoys the conveniences of city life in Iqaluit. "It's easy to get almost anything in Iqaluit," Tigullaraq says. "If I need a snowmobile part, if I need a truck part, I can get it in days." That, and getting fresh fruit and meat, is much easier in the territorial capital than in the outlying communities, he adds.

Moreover, he has hopes that the money brought in by projects like Baffinland will help Nunavut deal with its issues – from unemployment and poor housing to skills shortages and high food costs – and allow more people to achieve the balanced lifestyle he enjoys today. Royalties to Nunavut Tunngavik Inc. and fees to the territorial government will go a long way in reaching that goal. So will the job and training opportunities that projects like Mary River can provide. "I think the project is good for Nunavut," Tigullaraq says. "There are many advantages to getting a project up and running."

"I get a chance to think about many things that I do in my work when I'm out hunting. I'm never completely away from work."

For Joe Tigullaraq, the best way to wind down after a week of bringing home the proverbial bacon is a weekend of bringing home the char, seal and caribou. That's just how Tigullaraq likes to do things, given his background as a hunter and fisherman, and in wildlife management.

Today, however, Tigullaraq has a lot more on his plate as Baffinland Iron Mines Corp.'s northern affairs manager. In that role, it's his job to help establish good working relationships between the company – which hopes to mine iron ore at its Mary River project, about 1,000 kilometres north of Iqaluit – and the Nunavummiut of Baffin Island. He also supervises workers currently stationed in Clyde River, Pond Inlet, Igloolik and Hall Beach.

Though he spends much of his time in offices and boardrooms, Tigullaraq finds he can best tackle whatever issues come his way by doing what he loves best: heading out on the tundra and sea ice. "It clears my mind when I'm out there," he says. "I get a chance to think about many things that I

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Harnessing the Wind

Engineer **Liezl van Wyk** brings alternative energy to Northern diamond mining



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Rio Tinto as a business analyst, working in both Australia and United States before coming to the NWT.

"It's a fantastic combination," van Wyk says of her experience and how it relates to Diavik's wind project. "First of all, I use my electrical skills to get the right designs going... Then I use my management skills because there were so many permits I had to go after."

Indeed, completing the project was no small task. Business models had to be created to justify the project. Contracts had to be negotiated. Designs had to be adapted so that the technology would work in extreme conditions 300 kilometres northeast of Yellowknife.

Not surprisingly, van Wyk and the team at Diavik managed to do most of the project in-house without relying on outside consultants, something that van Wyk credits to the Diavik culture. "People are really inspired by how much trust and empowerment has been given to them," she says.

The larger accomplishment, however, lies in the project's proof that environmentally sustainable alternative energy can work at remote sites that would otherwise have to rely on burning diesel to generate power. All told, the wind farm – which consists of four 2.3-megawatt turbines each about 100 metres tall – will reduce diesel consumption at Diavik by about four million litres a year. That should lead to a six percent – or 12,000-tonne – reduction in greenhouse-gas emissions.

As of September, construction of Diavik's four turbines was complete and poised to begin delivering power. Meanwhile, van Wyk has moved on to new challenges as Diavik's manager of business improvement. In that role, she brings her talent to areas such as underground production, logistics and the general improvement of operations on site. 

"It's a fantastic combination... First of all, I use my electrical skills to get the right designs going. Then I use my management skills."

Liezl van Wyk comes to the diamond-mining industry with strong backgrounds in business and energy. These attributes have taken her around the world and, in 2010, landed her in Yellowknife, as the principal energy advisor for the Diavik Diamond Mine. In that role, she developed a unique program that's led to the construction of a wind farm at the mine's sub-arctic site. Starting this winter, it will supply at least eight to 10% of Diavik's energy needs.

"With climate change, the risk is very tangible," van Wyk says. "If we transport less diesel up the winter ice road because we now have wind that replaces it, we've already made that whole supply chain less environmentally risky."

Originally from Namibia, van Wyk earned a master's degree in high-voltage electrical engineering and started her career as an electrical engineer at Eskom, a major South African power company. She went on to earn an MBA from the International Institute for Management Development in Switzerland and, in 2007, joined

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Up to the Task

Trevor Attungala's work as a field supervisor is full of challenges. He wouldn't have it any other way.



"I've never had a better job... It has been a joy and a very good learning experience."

If you ask Trevor Attungala what he loves most about his job as field supervisor at Agnico Eagle Mines Ltd.'s Meadowbank gold mine, he'll list two things: the people he works with and the daily challenges he faces. And he works with a lot of people and deals with lots of challenges.

As field supervisor, Attungala supervises the mine's labour crew and its big machines – heavy equipment such as cranes, loaders, telehandlers, man-lifts and loaders all fall into his domain. Running them efficiently requires careful management. "There's a lot of planning involved with the mill department," Attungala says. "A lot of planning with the gyratory crusher, the main crusher that feeds the mill. We provide the crane services for that."

Also on his plate are camp duties such as waste management and helping manage incoming and outgoing air traffic, as well as the passengers and cargo on those flights. At the end of the day, Attungala says, if there's a general issue on site, often it's his department that gets a phone call. "It's been a


pretty challenging task, I've got to say."

But Attungala wouldn't want it any other way. "I've never had a better job," he says. Helping him face the daily challenges at Meadowbank, located about 70 kilometres north of Baker Lake in the Kivalliq region, are a crew of good people working under him. They are a very reliable group, he says. He is also grateful for the management team he reports to, which helps him get the job done. "It has been a joy and a very good learning experience."

A Baker Lake resident, Attungala started at the Meadowbank mine in May 2009 as a heavy-equipment operator. He had been spotted and offered a job by an Agnico-Eagle supervisor while he was working at the site operating tractor-trailers and loaders for a company called Arctic Fuels. In June 2010, he moved up the ladder to the position he holds today.

Although he's a supervisor now, Attungala is a heavy-equipment operator at heart. Even when he's on his two weeks off in Baker Lake, he will jump into a loader if there's work that needs to be done. "Most of the time I'll do it just for fun without getting paid. I love heavy equipment."

The two-weeks-on, two-weeks-off work rotation at the mine also makes Attungala happy as it allows him to spend time with his two sons and travel with them in the spring and summer. In fact, he's unsure if he would ever want to work a normal Monday-to-Friday schedule again. "It's two weeks on, and then it's like I'm going on vacation every month."

Attungala says he has seen Baker Lake and its people benefit from Meadowbank and is excited about the opportunities that might come to the region with Agnico-Eagle's proposed Meliadine mine, 25 kilometres northwest of Rankin Inlet. "Meadowbank is a very good thing," he says, "and a good thing to happen to Baker Lake." 



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Working Her Way Up

Stacie McSwain joined Snap Lake soon after high school. Now she has a career.



COURTESY OF DE BEERS CANADA

that's left are rough diamonds headed for safe storage in the Snap Lake vault.

It's complex and challenging work, and McSwain sits at its heart, monitoring the complete process on a bank of computer screens to ensure it moves smoothly. From her perch, she can identify issues as they arise, flag them to her supervisors, and help prevent small problems from becoming large ones. "It's almost like being a traffic cop," she says. "I try to catch things before they happen."

McSwain had never worked at a mine before she joined De Beers a Snap Lake. But she had a favourable impression of the industry: her brother worked at Diavik Diamond Mine and spoke enthusiastically about his experiences. All McSwain needed was a starting point. That arrived when she signed up for the operator-trainee program.

McSwain attended the three-month program in 2007, which covered the basics of mine operations, procedures and work culture, as well as literacy, math and other fundamental skills. The classroom work was followed by three months of training at the Snap Lake site. When she finished the program, De Beers offered her a full-time job.

Since then, McSwain has been upgrading her skills, completing the requirements to take on the more senior position in the control room. She started as a trainee; she's now certified to a level that she can act as a relief supervisor when called upon to do so. The next step is full certification as a supervisor.

Moreover, there's plenty of room to grow. McSwain is keenly aware of the future opportunities with De Beers Canada, especially as work progresses on its Gahcho Kué diamond project, which is now in the environmental assessment process. And she's excited about her prospects, wherever they may take her. "Everyday, you learn something new."

"At the time, I didn't really know what I wanted to do. This looked like a great adventure."

Five years ago, Hay River resident Stacie McSwain was a recent high-school graduate working with a local retail company. It was a good job and one that she enjoyed. But it did not hold out the kind of long-term potential and career-development opportunities that McSwain was looking for in life.

Then, one day, she spotted an ad in a local newspaper for a mineral process operator trainee program being offered at the Fort Smith campus of Aurora College, a few hours drive away. McSwain jumped. "At the time, I was two years out of high school. I didn't really know what I wanted to do," she says. "This looked like a great adventure, a great opportunity."

It turns out she was right. Today, McSwain is at De Beers Canada's Snap Lake diamond mine, working two-week rotations as a control-room operator. In that job, she's part of a team that operates the mine's process plant, which takes pre-crushed kimberlite from underground operations, breaks it down further and then filters it through a series of screens until all

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Close To Home

Donald Havioyak built a career helping communities. Now he's using that experience to help mining firms.




COURTESY MMG LTD.

MMG, but the more important job is to build bridges at the grassroots level. "I've been working to make MMG part of the community and see how we can contribute," Havioyak says. "We've been supporting recreation departments, community events and day cares, for example, in Cambridge Bay and Kugluktuk. We've been able to provide some computers so that non-profit organizations can have them for their own use."

When Havioyak started out, he was a social worker with the territorial government in his home community of Kugluktuk. He then went on to other positions with the government and also became active in local politics, at one point serving as Kugluktuk's mayor.

In 1999, Havioyak was elected as an MLA in Nunavut's first government and served in its first cabinet. However, he missed the direct contact with the community that was so important to him. He returned to the position of regular MLA so that he could get back to that.

These experiences have certainly helped Havioyak now that he's working with MMG in a business environment. But his contributions are not limited to the community. He's also helping MMG understand the place and people in the region where it hopes to one day build a mine and how it can contribute to their lives. "As visitors, we cannot know the realities of life in the North," says Charlotte Mougeot, MMG's manager of environment, regulatory and community affairs. "Donald brings a lot of common sense and a lot of knowledge to our team so that we can be more considerate in the things we do."

For Havioyak, it's a job that again gives him the opportunity to work for his community. "I enjoy working with Inuit organizations and, most of all, working one-on-one with Inuit... so that we can work together to make things better in the future." 

"I enjoy working with Inuit organizations and, most of all, working one-on-one with Inuit"

If a theme runs through Donald Havioyak's career, it boils down to a single word: community. From the earliest stages of his working life, he's found satisfaction in helping people, face-to-face, representing their personal and community concerns to decision-makers in politics and business.

Today, Havioyak is doing just that as the community-relations officer for MMG Ltd., which is proposing to develop a zinc-copper deposit at Izok Lake in the central Arctic's Kitikmeot region. The proposed project is still at the early stages – MMG filed a project description with the Nunavut Impact Review Board in August – so the company has yet to get into heavy discussions on the issues around community benefits such as training, employment and business opportunities. But building strong local relationships is the key to success in Northern resource development, and Havioyak has spent the last three years helping MMG build the foundations.

Part of the job is to keep government agencies up to date on developments at

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Mining for Life

Mike Borden grew up in mining. He's discovered that some things change – and some things don't.



ANGELA GEORISKO

manager for the Det'on Cho/Nuna Joint Venture, which has the contract with the federal government to oversee care and maintenance operations at the site.

Borden's career, however, runs much deeper. After finishing high school in Yellowknife, he enrolled in the Haileybury School of Mines in Haileybury, Ont., graduating two years later and returning to the NWT to work as a surveyor at Giant. He then tried his hand at engineering and enrolled at the University of Alberta. After a year and half, however, he decided to return to Yellowknife, where he landed a job at the Con Mine, just as the landmark Robertson shaft was being sunk.

Borden stayed at Con, working in the engineering and environment departments, for 23 years, only leaving shortly before the mine closed in 2003. A job with the territorial Transportation Department beckoned, and Borden accepted, working his way up to highways manager for the North Slave region. But he wouldn't be away from mining for long. Diavik offered him a job in 2007 and he accepted. "I was exposed to the new mining industry when I went there," Borden says. "Back in the 1950s, mines had their own communities built with them. You lived where you worked... Now you fly-in and fly-out. That's a big thing."

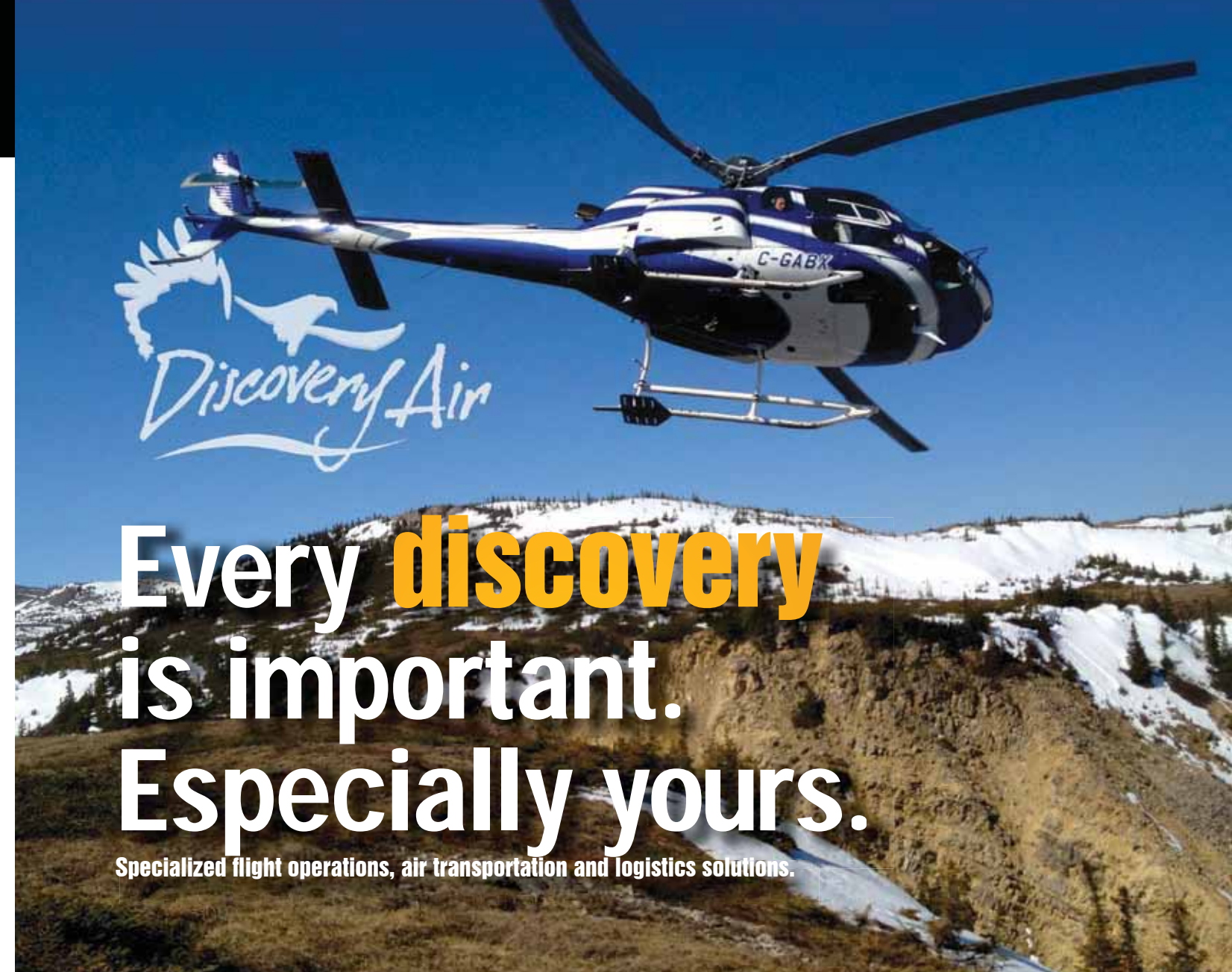
Borden also notes that health, safety and environment have improved greatly since his early days. But at least one thing has stayed the same: the mining industry still has a strong sense of community. "I can go to almost any mine and within 15 minutes we're talking about people we all know," Borden says. "Even in today's global industry, where people are going further and further afield, you still run into it." Indeed, the mining community that Borden grew up with at Discovery may be long gone. But in the modern world, the ties that bind the people in the industry remain. **M**

"I can go to just about any mine and within 15 minutes we're talking about people we all know."

It's unlikely that many people have roots in Northern mining as deep as Mike Borden. He grew up with it. Borden's father moved to the North in 1947 to work in the industry. During the 1960s, he located the family – including then school-aged Mike – to Discovery, a gold mine about 80 kilometres northeast of Yellowknife that operated between 1950 and 1969.

Borden fondly remembers his days at Discovery and the community of 150 or so people who called the mine site home. "The company was good to the families," Borden recalls. "They would fly the women to town for Christmas shopping... They had an ice-cream maker there. At four o'clock on Sunday afternoons, the ice cream would be ready, and all the kids would go down and pick up a bucket."

Having grown up with an operating mine as a community and a playground – "we had full run of the camp" – it's not surprising that Borden would build a career in the industry. Today, he works at the Giant property in Yellowknife as the mine



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The Ekati Diamond Mine was the first diamond mine built in the NWT. It went into production in 1998.

BY KAREN GOCHNAUER - NWT GEOSCIENCE OFFICE

Diamonds... and beyond

Much of the NWT's diamond mining industry is reaching middle age, but advanced exploration projects are pointing to the future.

As home to three of Canada's four diamond mines, the NWT remains a powerful and profitable mining region. But the end of mining at Ekati is coming into sight. Diavik, which marked its ninth anniversary this year, is now hitting the mid point of its plan. What comes next? Between ongoing mining and the potential of exploration projects like De Beers Gahcho Kué, diamonds will still be a big part of the NWT's future. But advancing work on gold, base metals and rare earths are broadening the possibilities.

Active Mines

Snap Lake Diamond Mine, owned by De Beers Canada Inc. is located 220 kilometres northeast of Yellowknife. It is the first diamond mine in Canada to operate fully underground and is the first mine De Beers has ever operated outside of Africa.

Snap Lake is also a complex project due to the ore body, which is a kimberlite dyke that dips down under the lake itself at an average angle of 12 to 15 degrees. Production figures for Snap Lake show it treated 855,000 tonnes of kimberlite and recovered 926,000 carats of diamonds in 2010. Processing and production declined slightly in 2011 (the latest available data), falling to just below 820,000 tonnes of kimberlite treated and 882,000 carats of diamonds recovered. De Beers Canada says the decline is the result of unexpected technical setbacks.

De Beers Canada concluded a comprehensive mine optimization program in 2011 that will see focused footwall development open up new areas of kimberlite. The company is forecasting steady production for the remainder of the mine's life, which is currently estimated at about 18 years. »



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In addition to mine optimization planning, De Beers also conducted an 11-hole surface drill program in 2011, combined with seismic surveys, to define an area of kimberlite located 700 metres to 1,300 metres from the mine's current workings.

Diavik Diamond Mine, owned by Rio Tinto plc (60%)/Harry Winston Diamond Corp. (40%) opened in 2003 at Lac de Gras. It is Canada's second diamond mine and the current

leader in production. In the first half of 2012, Diavik produced 3.4 million carats from 1.1 million tonnes of kimberlite and is forecasting total production of 8.3 million carats for the year. The increase is expected as production ramps up at underground operations on the mine's A-418 kimberlite along with additional production of one million carats from reprocessed plant rejects and 100,000 carats from recovery of smaller diamonds with the imple-

mentation of an improved recovery process.

These figures represent a substantial increase over 2011, which saw the recovery of 6.7 million carats from the processing of 2.2 million tonnes of kimberlite from the mine's three actively mined pipes, A-154 North, A-154 South and A-418. Those figures were slightly below company forecasts for the year as the plant was processing ore with a high number of heavy minerals.

The largest development at Diavik is its transition from an open-pit and underground operation at A-418 to a completely underground mine. The transformation began in 2010 and is expected to be completed this year.

At year-end 2011, underground drilling at A-418 increased the mine's reserves by 3.1 million tonnes. Diavik's proven mineral reserve now stands at 5.4 million tonnes of kimberlite with a grade of three carats per tonne. Probable reserves are estimated at 13.5 million tonnes, grading at 3.2 carats per tonne, extending the mine's expected life to 2022-2024.

A fourth pipe at the site, A-21, has a measured resource of 3.6 million tonnes at 2.8 carats per tonne. Development at A-21 was put on hold in 2008 and, subject to approval, is now part of a new life-of-mine plan requiring construction of a berm for open-pit mine operations of this underwater ore body.

Ekati Diamond Mine, owned by BHP Billiton plc (80%), Stewart Blusson (10%), and Chuck Fipke (10%), saw production fall in 2011 to 2.58 million carats, compared to 3.61 million carats in 2010. The decline was expected and is consistent with the mature stage of the overall mine plan. (Ekati opened in October 1998 and is now in its 14th year of production.) Unexpected heavy rainfall in the Lac de Gras region that year also contributed to the general performance. For the nine-month period ending in March 2012, production levels stood at 1.78 million carats.

In 2011, a US\$323-million expansion commenced at Ekati's Misery kimberlite, a satellite project about 30 kilometres south of the main camp. Misery first went into production between 2001 and 2005. The new work will see operations at the site run between 2015 and 2017. In addition, Koala and Koala North underground and Fox open pit make up the base plan. In August 2011, the Pigeon open pit was approved for definition phase.

Cantung Mine, owned by North American Tungsten Ltd. is located in the Nahanni region of the western NWT near the Yukon

border and is the only tungsten-producing mine in Canada. The mine itself has a long history. It first went into production in 1962, operating intermittently until 1986. North American Tungsten bought the property in 1997, though subsequent operations have also been intermittent.

Production at the property resumed in October 2010. In the early months of 2011, the start of its first full year of operation, it suffered from weak production rates, which North American Tungsten attributed to development delays, poor underground equipment and reduced mill availability.

To deal with the issues, the company invested a total of \$6.5 million in new power generators, mill equipment and upgraded systems, which led to overall improvements in production rates and mill capacity. Production reached approximately 2.2 million kilograms of tungsten trioxide by the company's year-end on Sept. 30, with a mill recovery rate of 75.3%. Mill recovery continued to improve in 2012, with North American Tungsten reporting a 76% recovery rate in the second quarter of this year.

Advanced Diamond Exploration

Gahcho Kué, owned by De Beers Canada Inc. (51%) and Mountain Province Diamonds Inc. (49%) is located about 150 kilometres south-southeast of the Ekati and Diavik mines at Lac de Gras and consists of four diamondiferous kimberlites. Three of them — 5034, Hearne and Tuzo — have probable reserves of 29.5 million tonnes grading at 1.66 carats per tonne for total diamond content of 49 million carats, according to 2012 estimates. Further drilling at Tuzo in 2012 has increased the volume of kimberlite to 11.78 million cubic metres from 6.6 million cubic metres.

The environmental assessment process is now underway to develop a mine at the site that will have an estimated 11-year life and produce an average of 4.5 million carats annually. De Beers reports that the review for the project is on schedule. Technical workshops were held in Yellowknife in May, and the company has responded to 347 requests for information from government agencies, First Nation groups and other parties. Public consultations are scheduled for December with a decision report for federal ministerial approval expected in July 2013.

Peregrine Diamonds Ltd. is exploring four diamond properties in the NWT — part of its portfolio of Northern diamond projects — in

the region of the Ekati and Diavik diamond mines. The properties are: Lac de Gras East, Lac de Gras West, Pellat Lake and the WO Project, which hosts the company's DO-27 kimberlite.

In the winter of 2012, Peregrine carried out a \$1.5-million geophysical and drill exploration program in the region, leading to the discovery, announced in April, of three new kimberlites. The first, known as the LD-1 kim-

berlite, is located about 12 kilometres west of Diavik and northwest of Peregrine's nine-hectare DO-27 kimberlite. (The company owns 71.9% of the DO-27 discovery, which has an indicated resource estimated in 2008 at 18.2 million carats in 19.5 million tonnes of kimberlite, grading at 0.94 carats per tonne. The balance of ownership in DO-27 is shared between Archon Minerals Ltd. and DHK Diamonds Inc.) CONTINUED ON PAGE 52.



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Agnico-Eagle Ltd.'s Meadowbank mine is one of its two Nunavut projects. It has a second project called Meliadine near Rankin Inlet.

BY THE AANDC NUNAVUT REGIONAL OFFICE, MINERAL RESOURCES

Nunavut: Uncovering the Potential

Exploration investment in Nunavut is rising.
The territory has a new place on the mining map.

Nunavut continues to experience healthy investment in mineral exploration and development in 2012, although high operating costs associated with work in a remote environment and softening of some commodity prices have presented challenges. Fewer projects were active in Nunavut in 2012 than in the previous year, but many companies maintained or expanded their presence in the territory.

As of September 2012, the area held under mineral tenure (including claims, leases and prospecting permits) totalled more than 11.3 million hectares, of which more than 1.8 million hectares was acquired since January. In addition, almost one million hectares is held under coal licences.

In the Kitikmeot region, significant gold and base metal exploration remained the focus, with some diamond production re-

initiated at the Jericho Mine. Uranium and gold remain the principal commodities explored for in the Kivalliq region where the Meadowbank gold mine is now in its third year of production. The Qikiqtaaluk region hosts an actively explored diamond district and the largest iron deposits in Nunavut, many of which saw exploration programs in 2012.

A number of green-fields exploration programs trimmed funds from their 2011 or planned 2012 spending levels, but some of the funds were replaced with increased investments and sustained commitments on ongoing projects by several major operators. Actual expenditures in Nunavut by the exploration industry may fall below the initial \$568.6 million spending intentions estimated by Natural Resources Canada, but are expected to come in well above the past five-year average of \$343.4 million. Nunavut,

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IRON

Several projects are progressing through the regulatory process, including Baffinland Iron Mines Corp's Mary River project located at the northern end of Baffin Island. The

Nunavut Impact Review Board issued its final decision report in September, recommending the proposed 21-year open-pit mine and related infrastructure proceed. Baffinland has outlined five deposits and four other occurrences in all, indicating a potentially long mining life for the region. Pending issuance of regulatory authorizations, construction of a 143-kilometre rail line from the proposed mine area on northern Baffin Island

to a deep-water port facility at Steensby Inlet could start as early as 2013. The mine could be in operation by 2018.

Other iron ore projects include Advanced Explorations Inc.'s Roche Bay and Tuktuk projects southwest of Hall Beach. A resource estimate was completed for Roche Bay along a portion of banded iron formation, indicating more than 500 million tonnes of iron ore. The Tuktuk 1 deposit is estimated at 465 million tonnes and, promising high iron grades have recently been reported from the two-kilometre-long Tuktuk 2 magnetic anomaly. Advanced Explorations Inc. announced a joint venture with XinXing Ductile Iron Pipes Co. Ltd. to investigate the direct-ship ore potential of Tuktuk 2. This joint venture begins with a two-year \$5 million investment for a drilling program. Also on the Melville Peninsula, West Melville Metals established an exploration camp and conducted extensive channel sampling over a strike length of an Archean banded iron formation at their Fraser Bay project to determine direct-ship ore potential.

Iron exploration at Haig Inlet on the Belcher Islands is continuing with a second year of drilling by Canadian Orebodies Inc. With an inferred resource published for Haig Inlet, the company is now focusing on additional targets including the Kihl Bay Anticline, Haig West and the Haig North Extension.

GOLD

Gold exploration in the territory is focused in the Kitikmeot and Kivalliq regions. In the Kitikmeot, Sabina Gold & Silver Corp. budgeted \$65 million for work on its Back River and Wishbone gold projects. In addition, the company submitted a project description on Back River to the Nunavut Impact Review Board to initiate the environmental assessment process. Elgin Mining Inc. conducted drilling at the past-producing Lupin gold mine, and also conducted exploration at the Ulu project.

In the western Kitikmeot, North Country Gold Corp. completed a spring drill program targeting an auriferous iron formation along the Walker Lake Trend at its Three Bluffs project. Earlier this year, Hope Bay Mining Ltd., a subsidiary of Newmont Mining Corporation, announced a care-and-maintenance measure for surface and underground exploration at its Hope Bay gold deposits as the company focuses efforts on other projects outside Nunavut. CONTINUED ON PAGE 54.



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In A Big Country

This map shows the location and diversity of the North's active mines and advanced exploration projects. It also shows the diversity in mineral resources with the potential to be developed. And diversity is a positive trend for the NWT and Nunavut. The more varied the locations of activity – and the more varied the minerals – the better the opportunity for the benefits of exploration and development to spread farther and wider. Moreover, the number of projects holds the promise of a stronger future for Northern mining, especially as its two largest mines – Diavik and Ekati – enter the middle and mature phases of their mine plans. For detailed maps of exploration activity in the NWT and Nunavut, visit miningnorth.com and follow the “Maps” link in the “Library” section.

LEGEND

■ ACTIVE	■ MAJOR EXPLORATION
GD GOLD	IO IRON ORE
DS DIAMONDS	SR SILVER
LZ LEAD, ZINC	CL COAL
CR COPPER	RE RARE EARTH METALS
TN TUNGSTEN	MM MULTIPLE MINERALS
UR URANIUM	



ACTIVE MINES

Cantung Mine

North American Tungsten Ltd. Tungsten, copper
Tungsten and copper property in the mountains of western NWT. About 300 km by road northeast of Watson Lake, Yukon. Mine life to 2014.

Diavik Mine

Rio Tinto plc (60%) Harry Winston (40%)
Canada's largest diamond producer. 300 km northeast of Yellowknife. Open pit and underground, but will be all underground in 2012. Diamond production 6.7 million carats in 2011. Mine life beyond 2020.

Ekati Mine

BHP Billiton plc (80%), Chuck Fipke (10%), Stu Blusson (10%)
Canada's first diamond mine. 310 km northeast of Yellowknife. Open pit and underground. 2.58 million carats of diamonds recovered in 2011. Estimated mine life to 2019.

Meadowbank Gold Mine

Agnico-Eagle Mines
Open-pit gold mine located in the Kivalliq Region, 300 km west of Hudson Bay and 70 km north of Baker Lake. Mine life to 2017.

Snap Lake Mine

De Beers Canada Inc.
Canada's first all underground diamond mine. 220 kilometres northeast of Yellowknife. Diamond production in 2011 totalled 881,000 carats Mine life to 2028.

MAJOR EXPLORATION

Back River

Sabina Gold & Silver Corp.
Approximately 60 km from Hackett River deposit. Comprises Llama, Umwelt, Goose and George gold deposits. Open-pit and under-ground mining proposed. Pre-feasibility study expected in 2013. Environmental assessment underway.

Chidliak

Peregrine Diamonds Ltd.
Diamond project located 180 km south of Pangnirtung. Contains 60 known diamond-hosting formations. Peregrine announced discovery of 60th kimberlite at Chidliak in July.

Courageous Lake

Seabridge Gold Inc.
Proposed open-pit gold mine 240 km northeast of Yellowknife. Positive preliminary feasibility study released in July with 6.5 million ounces proven and probable reserves.

Doris North/Hope Bay

Newmont Mining Corp.
Proposed gold mines 130 km south of Cambridge Bay. Covers majority of the Hope Bay Greenstone Belt. Work postponed indefinitely while project under review.

Gahcho Kué

De Beers Canada Inc. & Mountain Province Diamonds Inc.
Proposed open-pit diamond mine approximately 180 km ENE of Yellowknife. Environmental review underway. Public hearings scheduled for December. Ministerial decision expected July 2013.

Hackett River

XStrata Zinc Canada
One of largest undeveloped volcanic massive sulphide deposits in the world. 104 km south-southwest of Bathurst Inlet. Camp opened February, 2012; Pre-feasibility study team begin assembled for zinc, silver, copper, lead and gold project.

High Lake /Izok Lake

MMG Resources Inc.
Copper, Zinc, Gold, Silver
High Lake: 1,710 hectare, copper-zinc-silver-gold property, 190 km east-southeast of Kugluktuk. Izok Lake: High-grade zinc-copper-lead-silver deposit, 255 km southwest of Kugluktuk. Projects now being permitted as one project.

Jericho Diamond Mine

Shear Diamonds Ltd.
Project to reassess viability of reopening the former diamond mine, 255 km SSE of Kugluktuk. Currently produced 34,007 carats from old kimberlite stockpiles.

Kiggavik

AREVA Resources Inc.
Proposed uranium mine 80 km west of Baker Lake. Inuit Impact and Benefit Agreement negotiations began January, 2012. Currently in environmental review process.

Lac Cinquante

Kivalliq Energy Corp.
A high-grade uranium deposit at Kivalliq Energy Corp.'s Angilak Project in Nunavut. Hosts an inferred resource of 27.13 million pounds in 1.78 million tonnes averaging 0.69% U3O8.

Mary River

Baffinland Iron Mines Corp.
Proposed open-pit iron mine with railway and port 936 km north of Iqaluit with five known deposits. Public hearings for environmental assessment completed in July, 2012.

Meliadine Gold

Agnico-Eagle Mines Ltd.
Possible gold mine. Five deposits, the largest of which is the Tiriganiaq deposit, 25 km northeast of Rankin Inlet. Plan to complete feasibility study in 2013. All-weather road to site from Rankin Inlet located on Inuit-owned Lands.

Nechalacho

Avalon Rare Metals Inc.
Proposed underground rare earth metals mine 100 km southeast of Yellowknife. Environmental assessment underway.

NICO

Fortune Minerals Ltd.
Proposed open pit and underground cobalt-gold-bismuth-copper mine located 50 km northeast of Wha Ti. Environmental review underway.

Pine Point

Tamerlane Ventures Inc.
Proposed lead-zinc underground mine east of Hay River, NWT, on site of old Pine Point Mine, operated by Cominco Ltd. Closed in 1987. Resource is defined. Permitted for construction and mining.

Prairie Creek

Canadian Zinc Corp.
Proposed lead-zinc-silver underground mine 120 km west of Fort Simpson. In permitting and licensing. Preliminary feasibility study released in June.

Roche Bay

Advanced Exploration Inc.
Iron project with 500 tonnes of indicated resources within six km of a natural deep-water harbour at Roche Bay. Feasibility study due by end of 2012.

Selwyn Project

Selwyn Chihong Mining Ltd.
Proposed lead-zinc mine in the Yukon, but across from the NWT border and accessed through NWT. Feasibility study scheduled to be completed this year.

Three Bluffs

North Country Gold Corp.
A gold deposit comparable to Agnico-Eagle Mines Ltd.'s Meadowbank and Meliadine deposits. Located in one of Canada's largest unexplored greenstone belts.

ULU & Lupin

Elgin Mining Inc.
Gold projects located southeast of Kugluktuk. Lupin mine: past production of 3.7 million ounces. ULU deposit: indicated mineral resource; 751,000 tonnes grading at 11.7 grams per tonne.

Yellowknife Gold Project

Tyhee NWT Corp.
Proposed open-pit gold mine 88 km northeast of Yellowknife. Feasibility study expected released in August. Environmental review underway.



THE FUTURE IS NOW

TRAINING IS THE BACKBONE OF CREATING EMPLOYMENT OPPORTUNITIES FOR NORTHERNERS IN THE NORTHERN MINING INDUSTRY. IT'S GOING PLACES LIKE NEVER BEFORE. **BY ROBB COFFMAN**

Training at Agnico-Eagle Ltd's Meadowbank mine has included practice sessions in truck simulators. Agnico-Eagle also employs 12 full-time trainers at the site. Photo Graham Oxbby/Meadowbank mine.

STORIES ABOUT CAREER TRAINING USUALLY BEGIN with a quick profile of a person who's taken the plunge and discovered a world of new and satisfying opportunities. This is especially true in the North, where the realities of life in remote communities create barriers to employment and skill development. So, there's a reason for this general approach to storytelling. The profiles inspire. They put a face on positive trends and bring statistics to life. Which is exactly why we're going to use the tactic here – but hopefully with a small twist.

Meet Darren Clunie. A lifelong Yellowknifer, now aged 43, he was already in an established career when he caught the mining bug. Since graduating from high school in the late 1980s, he'd been working for the Government of the Northwest Territories. His first job was with the Health Department filing chest x-rays dating back to the 1930s of the men who worked in the territory's old mines. From there, he worked his way up the government ladder in medical record keeping and, after taking education leave, moved on to the Social Services Department as an income-support officer. >

A couple of years ago, however, Clunie started to feel it was time for a change. So he signed up for a mine-training program at Aurora College. “There were a lot of people younger than me in my class, just out of high school,” Clunie says, laughing. “But I knew this was going to be hard work and I wanted to see if I could do it.” Today, Clunie works at the Diavik diamond mine in the plant where the company converts mined granite into cemented rockfill, which is used to back-fill underground stopes. He celebrated his first anniversary as a Diavik employee in July and he’s happy with his new career. Not only does he enjoy the work, his two-week rotation gives him more time to spend with close family in Kelowna, B.C., than he could ever muster on the Monday-to-Friday schedule that most of us live by.

Clunie’s story says something important about the evolution of mine training and employment in the North. Although it is usually spoken of in terms creating jobs and opportunities in remote communities where unemployment runs high, the awareness of its benefits are becoming more and more widespread. Even people who already have established careers are looking at its potential.



Safety is a key component in programs offered by the Northwest Territories Mine Training Society. Here, trainees practice cold-water rescues.

And not a moment too soon. There are already four active mines in the NWT and six advanced-exploration projects that have the potential to become full-fledged mines over the next few years. In Nunavut, there are eight major projects with the same potential. That’s in addition to Agnico-Eagle’s Meadowbank mine near Baker Lake, and it’s likely the territory will soon be punching far above its weight as an active mining jurisdiction. All of this activity adds up to a definite conclusion: the North needs people to work in mining – fast. According to projections from the NWT Mine Training Society, direct employment in the territory will increase by almost 5,000 positions in the next few years. There’s a good chance demand will be just as great in Nunavut. The good news is that training efforts on the part of mining companies, businesses, colleges and governments in the North are making strides – and they are going further than ever before.

OF ALL THE PEOPLE involved in Northern mining, it’s doubtful there are many who feel the mounting need for mine training as acutely as Hilary Jones. As the general manager of the NWT Mine Training Society – a non-profit partnership comprised of industry, Ab-

original communities and government to deliver training programs in various job categories – she sits at the intersection where the supply and demand for mine employees meet.

Jones describes the rising need for people to work in Northern mines as a “deer in the headlights” moment. “Keep in mind that for every mining job, there are three service jobs attached to it,” she says. “We’ll need 15,000 people.” Of course, not everyone who works at a Northern mine, or with a mine contractor, has to be a Northerner. But the goal is to put as many residents in those positions as possible. Making the challenge even greater for organizations like the NWT Mine Training Society is that the national Aboriginal Skills Employment Program, which provided funding for their work, came to an end in 2012. Other federal programs still exist, but the total pool of financial support for training is more modest.

Since then, the mining industry and the territorial government in the NWT have stepped up, providing gap funding to keep the NWT society going for the next two years. They are also now collaborating on a new, pan-Northern funding proposal for training to present to Ottawa. That industry and government have moved so quickly to support the training society speaks volumes about the value they put on the organization. The simple reason is that the society, and others like it, gets results. Since the fall of 2004, the NWT society has trained more than 1,300 people, and more than 700 of those people have obtained employment in the mining sector. Likewise, the Kivalliq Mine Training Society blew past projections for the number of people trained and the number of people who found work, according to its 2010/11 annual report.

The secret behind the success has been a shift in how training is coordinated and delivered. Once, it was a speculative process. Programs would be put on, students would enroll and, at the end, hopefully find employment. Today, the system has evolved into what Jones calls “just-in-time” training – that is, delivering programs just before company’s are ready to start hiring – with an emphasis on delivering those programs locally in affected communities.

Here’s how it works: When a mining company is working in an area, it will make commitments to affected communities, either through impact-and-benefit agreements, cooperation agreements and/or socio-economic agreements with territorial governments. The agreements cover benefits such as community development and

Where the jobs are

A breakdown of Northern employment at the North’s major mines.

Ekati BHP Billiton
(First year of production: 1998)
Total Employment: 1,213
Total Northern: 650 (53%)
Total Aboriginal: 317 (26%)
Total Non-aboriginal: 333 (27%)

(Source: Ekati Diamond Mine 2011 Year in Review)

Diavik Diavik Diamond Mines Inc.
(First year of production: 2003)
Total Employment: 1,165 (100%)
Total Northern: 642 (55%)
Total Aboriginal: 291 (25%)
Total Non-aboriginal: 351 (30%)

(Source: Diavik 2012 Mid-Year Socio-Economic Monitoring Report)

Snap Lake De Beers Canada Inc.
(First year of production: 2008)
Total Employment: 678
Total Northern: 249 (37%)
Total Aboriginal: 145 (21%)
Total Non-aboriginal: 104 (15%)

(Source: De Beers Canada 2011 Year In Review)

Meadowbank Agnico-Eagle Mines Ltd.
(First year of production: 2010)
Total Employment: 746
Total Inuit Employment: 276 (37%)

(Source: Agnico-Eagle 2011 Corporate Social Responsibility Report)

* Figures for Meadowbank are for direct employment. Other figures include employment by mining companies and their contractors.



The workforce at Agnico-Eagle’s Meadowbank gold mine is 35 percent Inuit. A commitment to training helps the company maximize local employment.



ABOVE: Underground mining students assemble and bench-test mine rescue breathing apparatus. RIGHT: A trainee in a diamond-driller helper program gets on-site experience.

engagement with local business. Establishing local hiring targets is an important component as well. These days, much of the work for meeting targets is coordinated through mine training societies. With hiring targets established, the societies work to coordinate the human resource needs of the companies with the skill capacities of communities. Gaps are identified and then the societies, in collaboration with colleges and local employment coordinators, go into the communities to run training programs focused on specific hiring objectives. Mining firms also participate, both financially and through guest talks and site visits or on-site training opportunities. Community members can then move on to further training programs at colleges if they wish, which enhance their likelihood of success.

“We won’t run a program unless there are jobs attached to it,” Jones says. “We also look at community needs to see if there is a cross-over. A community may need heavy-equipment operators in terms of truck drivers and so on. The mine may need truck drivers as well. These would be the first programs we go after because there’s opportunity on both sides.”

An example of this approach is the More Than A Silver Lining training program, which launched this past July and will run until March 2014. A collaboration between Canadian Zinc Corp., local Deh Cho community governments and the federal and territory governments, it aims to train Deh Cho residents for jobs at Canadian Zinc’s Prairie Creek project. The courses, which are managed by the NWT Mine Training Society, include diamond drilling, camp catering and emergency medical services, among others.

This shift to a partnership approach arrived with the diamond-mining industry, especially after the opening of BHP Billiton’s Ekati mine. Ekati has set important standards with its investment in training, but as the first diamond mine in the NWT it also had a greenfield opportunity for local hiring when it opened in 1998. When Diavik started ramping up operations a few years later – it officially started production in 2003 – it had a smaller labour pool to draw on. To help address its needs, it collaborated on a community-training test project with the territorial Education Department, Aurora College and the federal government in the communities of Dettah and Lutselk’e. “It turned out to be a very good experiment,” Jones says. More than that, it laid the groundwork for what mine training in the North has become today.

ABOUT A YEAR AGO, Patrick Moloney, human resources manager for Fortune Minerals Ltd., found himself in the gym at Weledeh Public School in Yellowknife, swarmed by school-aged kids. The occasion was the NWT Rocks! Day at the 2011 NWT Geoscience Forum, part of a youth program developed by the territorial education department, the NWT & Nunavut Chamber of Mines, the NWT Geoscience Office and the NWT Teachers’ Association. During that session, hosted at the forum’s trade show, Moloney and other companies participated in a passport game in which groups of kids had to visit each booth and find answers to pre-set questions. “You’d have a gaggle of 15 or so kids show up at the booth wanting to know things like where your site is and the uses for what you’re producing,” Moloney recalls. “It was really good. It gave you an opportunity to talk to the kids.”

“We’ve been struggling to get people in areas like mine engineering, geology, financial management in terms of accounting and environmental sciences so this is a fantastic initiative.”

Gaeleen MacPherson, the manager of human resources and administration for Snap Lake

Those youngsters obviously weren’t hiring prospects for Fortune Minerals. But they just might be in a few years. The company’s NICO project a – gold-cobalt-bismuth deposit about 160 kilometres north of Yellowknife in the Behchoko region – just completed public hearings for its environmental assessment in September. Assuming all goes well, it will be looking to hire 400 people to work on the construction of its mine in the not-too-distant future. Longer term, it will need a permanent staff of about 180 people to handle production, with the initial figure at around 270 due to work on a shorter underground mining phase. That means hiring and training have been high on the company’s radar for some time and much preparatory work is underway, including ongoing meetings with nearby communities and business organizations to discuss anticipated needs and expectations.

But mine production isn’t the only point at which Northerners are participating in the minerals industry. Opportunities are arising at ever-earlier stages in the process, and Fortune has been taking full advantage of local hiring during exploration. “We’ve been tracking this since

2007,” Moloney says, “and 75 percent of the people we’ve hired to work at the camp have been First Nations people from the North.” Moreover, Fortune is not alone in this trend. Avalon Rare Metals, which is proposing to build a rare earths mine at Thor Lake in the Akaitcho region south of Great Slave Lake, collaborated with the NWT Mine Training Society, Aurora College and Foraco Canada Ltd., its drilling contractor, to create a driller’s helper training program targeting young Northerners. This program marked the first time the training society developed a program in collaboration with – and specifically for – an exploration company.

As training and employment opportunities are expanding at earlier stages of the mineral development process, serious efforts are also underway to increase opportunities for advancement within companies. Trades apprenticeships are an important component of this development, and ongoing support will have the added benefit of leaving a legacy of skills in the North when mines come to the end of their lives. Diavik, for example, has a commitment to skilled trades, with 36 apprentices now working at the site, according to the company’s 2012 mid-year socio-economic report. BHP Billiton’s Ekati mine recently announced a five-year, \$300,000 partnership with Skills Canada NWT to support trades programs. Meanwhile, De Beers Canada had 15 apprentices in seven trades at its Snap Lake mine during 2011.

Creating management capacity is also a major goal. This year, De Beers Canada announced a new post-secondary scholarship program, worth \$30,000 in the 2012-13 academic year, to help people prepare for professional careers associated with its Snap Lake mine and Gahcho Kué advanced-exploration project. “We’ve been looking at the question of how to get people from the North into professional positions,” says Gaeleen MacPherson, the manager of human resources and administration for Snap Lake and herself a lifelong Northerner who’s charted an upward career path since completing a bachelor’s degree in management at the University of Lethbridge. “We’ve been struggling to get people in areas like mine engineering, geology, financial management in terms of accounting and environmental sciences... So this is a fantastic initiative.”

The NWT Mine Training Society also offers a program to help prepare Northerners for management positions: the Northern Leadership Development Program. Pioneered by Diavik and then taken over by Aurora College, it provides students (all of whom are funded by their employers) with an eight-module program that covers subjects such as team leadership, communication skills, conflict resolution, diversity and problem solving. It too has been a success.

Expect more to come as future opportunities and demand move ever closer to reality. After all, the goal – for industry, business, government and communities alike – is to create opportunities for Northerners to build better futures. Mine training plays an important role in reaching that objective. And it benefits more than the people directly involved when you consider the spin-off benefits of having a healthy, local labour market. In the long run, everybody wins. **M**





BY MIFI PURVIS

TAKING CARE OF BUSINESS

MINING INVESTMENT IS CREATING ENTREPRENEURIAL BOOMS ACROSS THE NORTH. THE SECRET TO SUCCESS? **PARTNERSHIPS THAT WORK.**

George Mackenzie is not one to bask in the success of Tłı̨chǫ Investment Corp., the business arm of the Tłı̨chǫ First Nation in the North Slave region of the NWT. As president of the eight-year-old holding company with businesses engaged in remediation, construction, mining, logistics, transportation and more – not to mention revenue of more than \$100 million in three of the past four years – he knows there simply isn't the time. There's too much work to do.

Still, it's hard not to marvel at the corporation's accomplishments. Before the arrival of the diamond industry, much of the economic spin off from mining and exploration in the NWT bypassed local communities. "We had outside companies coming in and doing work our young people were capable of," Mackenzie says. >

PETER TAPATAI: "At one time, Baker Lake depended on government handouts. Now we earn \$10 million in wages." Photo courtesy of Areva Resources Canada Inc.

“Our elders and elected leaders agreed to form an impact-and-benefit agreement (IBA) with the mining companies. When the IBA happened, business opportunities opened up.”

George Mackenzie, President, Tłı̨chǫ Investment Corporation



MICHAEL ERICSSON/UPHERE

ABOVE: Trucks line-up at an ice-road staging area in Yellowknife. Truckers will make 8,000 trips to supply mines during an average two-month ice-road season. RIGHT: An exploration meeting at Baffinland Iron Mines Corp.'s Mary River project. If the mine is approved, Baffinland plans to break major construction projects into smaller chunks so that Inuit firms can bid on them more readily.

Something had to change. So local band leaders and elders began taking steps to capitalize on the opportunities. One of the first was the formation of a construction company, Mackenzie says. But something else was happening in the territory at the same time. Diamond exploration that a few years earlier had led to the historic discoveries at Lac de Gras was beginning to prove that it was possible – and very profitable – to mine gem-quality stones in remote regions of the Slave craton.

Part of the Canadian Shield, the Slave craton's giant rocky knuckles characterize the landscape in parts of NWT, Nunavut and the northern prairies. It has long been known for its mineral potential. It now seems almost prescient that the Tłı̨chǫ people who live in the communities of Behchokó, Gamètì, Wekweètì and Whatì would begin building their own business capacity just as diamond mining was taking root in the region. The businesses that fall under TIC, incorporated in 2005, grew alongside the diamond mines, participating in a remarkable era of entrepreneurship and business growth Aboriginal and otherwise that transformed the NWT.

The growth of Tłı̨chǫ Investment Corp. offers a case study in the scope of that change – both for the corporation itself and the communities it serves. “Twenty years ago, our young people were in the welfare line,” Mackenzie says. “There was a long line for the territorial hous-

ing program. Now our young people can qualify for a mortgage. They can buy their own houses. In the back, there's a truck and a skidoo.”

More remarkably, the early years of business growth in the Tłı̨chǫ region occurred without the benefit of a regional land claim – a fact that challenges the traditional idea that unsettled claims are necessarily an impediment to Northern economic development. And while Tom Hoefer, executive director of the NWT and Nunavut Chamber of Mines, acknowledges that unsettled land claims can be a barrier to development, cooperation between mining companies and communities can overcome it and leverage the benefits of resource development. “We have two world-class mines, Diavik and Ekati, and these were built in the absence of settled land claims,” Hoefer says. “The benefits are already being realized.”

Economic Development Goes Big

Tłı̨chǫ Investment Corp. is a leading example of aboriginal business development, but it's only one of several. Two others are Det'on Cho Corp. and Kitikmeot Corp., the respective business development arms of the Yellowknives Dene and the Kitikmeot Inuit Association. Det'on Cho and Kitikmeot Corp. are active in many business sectors, but mining is an important part of their portfolios. Det'on Cho, for example, is a partner in the Kete Whii/Procon joint venture, which provides underground mining operations at Ekati and participated in Snap Lake mine construction. Kitikmeot Corp. is a partner in Kitikmeot Cementation Mining and Development, which completed a multi-year contract for exploratory underground work at Diavik.

How Much Do Northern Mines Spend on Northern Business?

The short answer: a lot. Check out the numbers from last year.

Diavik

Total Spent: \$438.1 million

To Northern Business: \$302.7 million (69%)

To Aboriginal Business: \$124.8 million (28%)

(Source: Diavik 2011 Socio-Economic Monitoring Report)

Ekati

Total Spent: \$327 million

To Northern Business: \$197 million (60%)

To Aboriginal Business: \$75 million (23%)

(Source: Ekati Diamond Mine 2011 Year in Review)

Snap Lake

Total Spent: \$161.5 million

To Northern Business: \$110.1 million (68%)

To Aboriginal Business: \$39.9 million (36.2%)

(De Beers Canada 2011 Year in Review)

Meadowbank

Total Spent: \$355 million

To Nunavut: \$185.1 million (52%)

(Source: Agnico-Eagle Ltd. 2011 Corporate Social Responsibility Report)

Indeed, a number of Aboriginal companies that are now part of TIC's portfolio had already won major contracts with the Ekati and Diavik projects before the First Nation completed its claim in 2003. The driver behind the growing business relationships came from within. “Our elders and elected leaders agreed to form an impact-and-benefit agreement (IBA) with the mining companies,” Mackenzie says. “When the IBA happened, business opportunities opened up.”

With agreements in hand, TIC partnered with Domco, a food-service company, to form a business aimed at capturing contracts with the new mines. It also partnered with Landtran Systems Inc. to form Tłı̨chǫ Landtran, a transportation company. A few years later, TIC bought out all the shares

in Tłı̨chǫ Landtran, and both the transportation company and the food company remain successful players in Northern business.

Today, TIC is a multifaceted organization with businesses in several sectors. Its Tłı̨chǫ Logistics, for example, provides site services and bulk fuel to BHP, Diavik and De Beers Canada at their Northern projects, as well site management and maintenance services for remediation efforts at the old Colomac mine. It has also moved into aviation with a majority stake in Tłı̨chǫ Air, a joint venture with Air Tindi Ltd. (a subsidiary of Discovery Air Inc.). At the end of last year, Tłı̨chǫ Air bought a \$5-million Dash 7 aircraft and went on to sign multi-year, multi-million-dollar deals for services to Ekati and Diavik. A few months later, TIC was honoured by the NWT Chamber of Commerce as the 2012 Business of the Year.

Mackenzie acknowledges that not all of TIC's ventures have been totally successful and the journey has brought challenges. “We need to revisit and reorganize. Not all our businesses are equally profitable, but we need to maintain overall profitability.” He also says developing management capacity in local communities is a major goal. TIC has been an important employer in its communities, but it wants to have more Tłı̨chǫ people running the organization. “We need to send more of our young people for post-secondary education in business” Mackenzie says.

Still, there are many rewards for companies like TIC that become business leaders. For example, its firm Tłı̨chǫ Engineering & Environmental Services Ltd., an environmental engineering service dedicated to site remediation and cleanup, has provided excellent opportunities for young people. “They can go there and learn workplace skills,” Mackenzie says. “It has won workplace awards and produced managers, foremen and superintendents. Some of these young people have never been given an opportunity before.”

THE DIAMOND INDUSTRY changed the economic face of the NWT and dominated Northern economic news through the 1990s and 2000s. In more recent years, however, Nunavut has emerged as a destination for major exploration and development programs. Travelling north with that investment are opportunities for business and economic development, thanks to provisions for impact-and-benefit agreements contained in the Nunavut land claim settlement.

“The IBA was very important for us,” says Greg Missal, vice-president of corporate affairs for Baffinland Iron Mines Corp., which is proposing to build an iron mine at its Mary River Property in north-central Baffin Island. “Written right into the Nunavut Land Claim Agreement are things like business opportunities and jobs for local people.”

The largest iron project in Canada and the largest proposed mine of any kind north of the Arctic Circle, Mary River is currently working its way through Nunavut's environmental review process. At the same time, Baffinland is building partnerships with local businesses. Inuit business development organizations, such as the Qikiqtaaluk Corp., the development arm of the Qikiqtani Inuit Association, are an important part of that process. But Missal says the examples of successful efforts to support business development in the NWT are important guides, too. That's because Nunavut has limited experience of its own to draw on. The only other major examples of mining in the territory are the Polaris and Nanisivik lead-zinc mines and the Lupin gold mine all of which closed years ago. Indeed, local engagement has been part of Baffinland's process from the earliest stages of its project. “You need to start talking to Inuit and community groups years before your project. You need to have consultation and Aboriginal involvement in the planning stages of the mine,” he says. “If you can't get it right, you can't do it. We are guests on their land.” >



COURTESY BAFFINLAND

» TAKING CARE OF BUSINESS

Missal says Baffinland will have decades' worth of work for local contractors, most of whom will form majority partnerships with outside businesses with an eye to taking over the businesses once the local capacity is in place. One major area for involvement will be building a 149-kilometre railway and a deep-water port at Steensby Inlet, on Baffin Island's northwestern coast. With those projects – and other components of its proposed mine, including infrastructure and reclamation – Mis-

sal says project planners will break down the work into manageable chunks to put it within reach of local firms.

The impacts are already apparent. Qikiqtalik Corp. is partnering with the Fortune 500 engineering firm Kiewit Corp. to bid on Mary River contracts. It's also buying into maritime carrier Nunavut Sealink and Supply Inc. "For this project to succeed, the entrepreneurial vision has to be there at the start," Missal says. "And we definitely see it starting to happen."

Entrepreneurial vision may be rising on Baffin Island, but it can be found throughout

the territory. Consider Peter Tapatai, owner and operator of Peter's Expediting Ltd. in Baker Lake. His company provides logistics for mining and exploration companies operating in the Kivalliq region and works in partnership, as the majority shareholder, with Yellowknife-based Braden-Bury Expediting Ltd.

With a 100 per cent Inuit staff, Peter's Expediting offers a range of services, including overland hauling, airlift ground handling, sealift coordination and community consultation. But the business wasn't always so diverse. When Tapatai started his firm, he targeted a junior gold exploration company working in the region called Cumberland Resources Ltd. "It grew bit by bit, increasing the need for fuel and materials every year," Tapatai says. Peter's Expediting grew right alongside it.

Along the way, Cumberland's president and CEO Kerry Curtis paid close attention to his company's community relations – with advice from Tapatai. "I advised Kerry to keep the community informed," Tapatai says. "He needed to talk to the hamlet councils, hunters and trappers associations, the elders and the Inuit association. That is the model he used."

In a first for modern mining in the North, Curtis took his project – Meadowbank – from discovery, to feasibility, to permitting and construction. In 2007, he sold the property to Agnico-Eagle Mines Ltd. It is now a fully operational gold mine, with more than 500 employees and an annual production estimate of 295,000 ounces for 2012. The relationships that Curtis built during his years with Meadowbank have continued under Agnico-Eagle, which has been equally transparent. "They behaved like a good partner and were prepared to answer tough questions," Tapatai says. The community was so well informed, in fact, that the positive feedback it gave about the company "was a key factor in why the project moved so fast through the Nunavut Impact Review Board."

More than that, Agnico-Eagle stepped up when it came time to help the community take advantage of the opportunities on offer. When Baker Lake's leaders and elders understood that Meadowbank – and projects that will hopefully follow – would need a trained workforce, Agnico-Eagle invested in a haul-truck simulator to help local people develop skills they'd need for the job. Many went on to become employees. Today, 170 people from Baker Lake are employed directly or indirectly at Meadowbank. "It has had a positive impact," Tapatai says. "At one time, Baker Lake depended on government handouts. Now we earn \$10 million in wages. Now the government benefits. Our community is now full of active taxpayers."

CONTINUED ON PAGE 58 »



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PARTICIPATION IN MINING REVENUE THROUGH ROYALTIES IS HELPING ABORIGINAL GOVERNMENTS GROW. A NEW PROPOSAL FOR EQUITY PARTICIPATION MAY RAISE THE GAME EVEN FURTHER

ON SEPT. 18, 1967, a pair of chartered aircraft landed in Yellowknife. One carried a cargo of books and documents, some 30 tonnes worth. The second carried people – public servants who had come North to start building a new territorial government, one that would represent its citizens from the newly minted capital in Yellowknife rather than from meeting rooms in far-off Ottawa.

The leadership of the new government – known as the territorial council – was a mixed affair, comprised of seven elected members and five federal appointees. It would be another eight years before residents of the Northwest Territories, which then included what is now Nunavut, elected their first fully representative government. But the council quickly set about building a civil service and launched the process to start bringing responsibility for government to the North itself. Education was the first program to be transferred. More followed in the ensuing years, including health care, social services and highways. >

DAVE CUTLER



Baffinland Iron Mines Corp.'s Mary River project, if approved, will generate substantial royalties for NTI.

COURTESY BAFFINLAND IRON MINES CORP.

This process of devolution – the transfer of powers from the federal government – remains a priority for the territorial governments to this day. The NWT is currently in the process of negotiating a suite of transfers, in consultation with Aboriginal governments, based on an agreement-in-principle with Ottawa signed in January 2011. In Nunavut, the process received a kick-start this past May after the federal government, which had been reluctant to come to the table in recent years, appointed a negotiator to lead its participation on the file.

Although much has been accomplished by devolution in the past, many issues remain on the table. The transfer of control over land, water and resources are major themes in negotiations. A key area is the transfer of power over resource royalties for development on Crown lands. This would give the territorial governments greater ability to raise revenue for programs and services that are now paid for largely by federal transfers. But it's a complex issue, one made all the more difficult by royalty-sharing agreements with aboriginal governments under land claims, not to mention designing a system that can withstand resource industry cycles.

For that reason, the devolution of control over resource royalties to the North will take a long time to negotiate. But some of the goals of this policy objective are already being achieved – both passively and actively – due to the presence of a robust Northern mining industry. Land claim agreements, for instance, include channels by which land-claim organizations share in resource royalty revenue paid to the federal government. Further revenue will likely be generated by royalties for work on Aboriginal-owned land. And in one new case, a company working in the NWT is opening the door to revenue sharing by Ab-

original communities, offering direct equity participation in its project via an impact-and-benefit agreement.

This isn't devolution in any governmental sense. But if one of the overall goals is to increase Northern participation in the revenue streams created by mining (and other resource development), progress is happening. Here's how.

Resource Royalties: Sharing the Crown

The mining industry is the largest private-sector taxpayer in the North and the revenue it generates in the form of resource royalties is an important source of government funding. In the NWT and Nunavut, however, resource royalties have always bypassed the territorial governments. Instead, they have been paid to the federal government, which supports the territorial governments with annual transfers to help cover the costs of programs and services.

Understandably, participating in the direct collection of resource royalties has long been a goal of both territorial governments. When times are good, they can provide excellent opportunities to expand and improve services. The problem is, resource markets tend to be cyclical, and governments can't always count on royalties to meet every need on a year-to-year basis. Thus, devolving control over royalties has been a difficult issue.

That said, the federal government has, as a result of land claims, ensured that a portion of the royalty revenue it collects flows back to Northern Aboriginal communities. Since 2001, more than \$33 million

Pieces of the Pie

The value of Crown Royalties shared with land claim groups for diamonds in the NWT and mining in Nunavut

Gwich'in Tribal Council		Tłı̨chǫ Government	
Total:	\$11,081, 331*	Total:	\$12, 826,945*
2011:	\$957,882	2011:	\$1,332,079
2010:	\$1,804,291	2010:	\$2,509, 150
2009:	\$498,641	2009:	\$693,431
2008:	\$1,306,921	2008:	\$1,817,477
* Since 2001		* Since 2003	
Sahtu Secretariat Inc.		Nunavut Tunngavik Inc.	
Total:	\$10,814,452*	Total:	\$10,970,971*
2011:	\$957,882	2011-12:	\$387,000
2010:	\$1,804,291	2010-11:	\$2,249,500
2009:	\$498,641	2009-10:	\$0
2008:	\$1,306,921	2008-09:	\$0
* Since 2001		* Since 1993-94 fiscal year	

has been paid to land-claim governing bodies in the NWT from diamonds alone. The Gwich'in Tribal Council, representing communities in the Beaufort Delta region, has received more than \$10 million in total. The Sahtu Secretariat, representing Dene communities in the general region of Norman Wells and Great Bear Lake, has also received more than \$10 million. The Tłı̨chǫ Government in the North Slave region has received \$12 million since concluding its claim in 2003. Nunavut has benefited similarly, with its land-claim organization, Nunavut Tunngavik Inc. (NTI), receiving a total of almost \$11 million since the 1993-1994 fiscal year, when the land-claim agreement was signed.

These are substantial sums, but by themselves they are not game-changers for Aboriginal governments. The picture shifts, however, when it comes to the potential of royalty revenue for development on Aboriginal-owned land. This prospect looms large in Nunavut, where there are eight advanced-exploration projects, many of them involving land owned by the Inuit under the Nunavut claim.

Part of the revenue will come from access fees where Inuit hold surface rights to land where resource firms want to work. But the big prize is to be found on lands where they hold subsurface rights – and the right to 100 per cent of the resource royalties from developments on these lands. NTI representatives declined to be interviewed for this article as it is still working out details of internal agreements on revenue sharing among Nunavut's regions. But already the benefits are accruing. In May, NTI received its first royalty payment from Agnico-Eagle Ltd's Meadowbank gold mine near Baker Lake, worth \$2.2 million for the 2010-11 fiscal year. And that could be just the start, NTI leaders have said. In a November 2011 interview with *Nunatsiaq News*, NTI president Cathie Towtongie said the value of royalty revenue from development on Inuit land could reach as much as \$2 billion in the coming decades due the number of

mining projects working their way through approvals.

To manage the money, NTI has proposed creating a trust to be run by a seven-member board, including the NTI president, representatives from Nunavut's three regional Inuit associations – the Kitikmeot (Central Arctic), Kivalliq (west Hudson Bay) and Qikiqtani (Baffin Island) — and three independent senior financial professionals. Details of the trust have yet to be voted on by NTI's membership, but Towtongie said she expects that to happen in 2013.

Whatever final form the agreement takes, one thing is certain: NTI and its member regional organizations could very soon have a new and significant income stream to support their broader goal of advancing Inuit economic, social and cultural well-being.

Revenue Sharing: Increasing Participation

When it comes to Northern benefits derived from resource revenues, the mining industry plays a passive role. It must pay for the right to develop public resources, regardless of whether that money goes to federal, territorial or Aboriginal governments. Royalties are simply a cost of doing business.

With the arrival of the diamond industry, however, it has become essential for mining companies to negotiate agreements with communities and regions affected by mineral development to ensure the benefits and opportunities created by these projects contribute to the society in which the industry operates. These agreements go by many names, such as socio-economic agreements, participation agreements or impact-and-benefit agreements. Whatever the nomenclature, all share common features, including hiring targets, training commitments, scholarships and frameworks for creating business opportunities.

Many also include direct payments to affected Aboriginal communities as way of contributing to overall community development and to help them deal with changes that arise with the arrival of industry. (These agreements are generally private and the financial details are rarely made public beyond the communities that benefit from them.) Overall, this is a passive approach to what amounts to a form of revenue sharing. But change may be on the horizon. A company called Avalon Rare Metals Ltd. has developed a new approach to revenue participation by Aboriginal communities – one that may also help grow their capacity to participate in the minerals industry to even greater levels.

Avalon is in the advanced stages of exploration at its Nechalacho rare-earths mineral project about 130 kilometres southeast of Yellowknife in the Akaitcho region. Approvals pending, it hopes to bring a mine into production in 2016. The company has already developed strong connections with its neighbouring communities – N'dilo, Detah, Łutselk'e and Deninu Kue – and has signed or is negotiating comprehensive accommodation agreements with them. The most unique feature of the talks is an offer to provide 10 per cent of the equity in the Nechalacho project to the communities, giving them the opportunity to participate in the revenue and ownership of a future mine. ➤

"What we're trying to do is new to the Northwest Territories, and relatively new in Canada," says Avalon president Don Bubar. "I think it's the future because it provides First Nations with a long-lived asset that will grow in value over time. It works from the company side as well because there is an alignment of interests between the company and the community."

Bubar is advancing this proposal as a person with a deep background in Aboriginal relations, having served as chair and member of the Prospectors and Developers Association of Canada's Aboriginal-relations committee for many years. Through that experience, he's developed a keen appreciation for community consultation and involvement in mining and a broad understanding of the options to achieve those goals.


When it comes to equity participation in mining projects, Bubar says there aren't

many prior examples in Canada, although the model has been used successfully in the energy industry. For that reason, the communities around Nechalacho have been cautious in their approach to the idea. But they've also been listening carefully, and at least one has already taken up the offer.

In July, the Deninu K'ue signed an agreement to take a three per cent stake in Nechalacho, representing its share of the total 10 per cent offer. At the ceremony celebrating the signing of the agreement, the Deninu K'ue chief Louis Balsillie and elder Robert Sayine both said the deal will help their community move forward. Bubar agrees. "I think you're going to see more of these agreements in the future because they can help First Nations build capacity so they can become more active participants in the industry."

Indeed, as Aboriginal communities deepen their engagement with mining – through training, employment, business opportunities and now, potentially ownership – Bubar foresees a day when they could become drivers behind mineral development in the North. “That’s the ultimate goal,” he says. “The next step, in my view, is for Aboriginal companies to acquire the mineral tenure, to do the work traditionally done by prospectors and exploration companies, to identify targets and then going and finding companies to partner with in the development.”

IN TALKING ABOUT the mining industry's contributions to big-picture social and political development in North, there's one important fact to remember: mining companies are not governments. Nor should they be mistaken for them. The point is that the industry – especially since the development of diamond mining in the NWT during the 1990s – has made groundbreaking contributions to Northern development by creating a strong base for the economy. From that foundation, Northerners have developed and discovered new ways of leveraging the opportunities mining creates to achieve their own goals.

In this respect, the mining industry has emerged as a major partner in Northern development. Its contributions come from the strong commitments it has made – and continues to make – to the regions in which it operates. Although those contributions are often the subject of debate, their impact is difficult to underestimate. After all, an emerging society needs a strong economy to advance its goals. Mining is helping to build that in the North. And that benefits everyone. 

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The second kimberlite, called LD-2, lies about 2.5 kilometres west of DO-27. The final discovery – LD-3 – was made on a claim 100 per cent owned by Peregrine about seven kilometres south of DO-27. A fourth target was drilled without intersecting kimberlite and fifth target was not drilled due to that result.

Advanced Gold Exploration

Yellowknife Gold Project, Tyhee Gold Corp.

In August, Tyhee completed a feasibility

study on its wholly owned Yellowknife Gold Project, located 50 to 90 kilometres north of Yellowknife. The property includes several zones covering 12,635 hectares, notably the Ormsby, Bruce, Clan Lake and Nicholas Lake deposits. Estimated proven (Ormsby) and probable reserves (Ormsby, Bruce, Clan Lake and Nicholas Lake deposits) are 20.43 million tonnes at an average grade of 2.03 grams of gold per tonne.

The feasibility study includes a base case

of US\$1,400-per-ounce gold and a projected 4,000 tonnes-per-day processing. The case incorporates open-pit and underground mining from four of its deposits containing 1.33 million ounces of gold from proven and probable reserves resulting in a mine life of 15 years.

The Yellowknife Gold Project entered the environmental assessment process in 2008 with an application to the Mackenzie Environmental Impact Review Board. Tyhee submitted a Developers Assessment Report to the board in May 2011 and is now working on the request-for-information phase of the project. Final engineering for the project is scheduled to begin in the fourth quarter of 2012 and continue through 2013.

Courageous Lake, Seabridge Gold Inc.

Seabridge is conducting exploration at its wholly owned 27,263-hectare property, which runs 53 kilometres in length along the NWT's historic Courageous Lake Greenstone Belt, about 240 kilometres northeast of Yellowknife. During 2010 and 2011, Seabridge conducted exploration programs, with spending totalling \$31 million.

In July, the company released a pre-feasibility study of the property, using a base case of a single open-pit mine with on-site processing. The report estimates proven and probable reserves at 91.1 million tonnes of ore, grading at 2.2 grams of gold per tonne. Based on processing of 17,500 tonnes of ore per day, Seabridge could see an annual average throughput of 6.1 million tonnes for the mine. At this rate, the mine would have a 15-year life and production of 385,000 ounces of gold annually.

High grade gold intersections reported in September from the summer drill exploration at Walsh Lake are considered to be the extension of the historic Tundra Gold mine, 1.4 kilometres to the north. The Walsh Lake drilling is located 10 kilometres south of the Fat deposit, which is also reported in Seabridge's July pre-feasibility study.

Advanced Metals Projects

Nechalacho, Avalon Rare Metals Inc. Avalon has updated the measured resource estimate on its Nechalacho rare earth deposit at Thor Lake, located 100 kilometres southeast of Yellowknife on the north shore of Great Slave Lake. For the Basal Zone, the estimated measured mineral resource is 8.9 million tonnes grading at 1.64% and 21.72% HREO/TREO. (HREO refers to heavy rare earth elements calculated as oxides. TREO is total rare earth elements calculated as oxides.)

The indicated mineral resource is 63.76 million tonnes at 1.52% TREO with 21.41% HREO/TREO using a base case cut-off of \$260 per tonne net metallurgical return. Recent drilling has provided definition of the measured mineral resource to refine the mine plan. It includes a 40-tonne bulk sample for metallurgical testing and geotechnical drilling for the location of tailings, the ramp route and surface infrastructure. Drilling in 2012 totaled 10,725 metres, bringing the total from 2007 up to 95,942 metres. An updated mining reserve will be completed once the 2012 drilling has been incorporated into the block model.

Advancements have been made on metallurgy and will be followed up with a pilot-plant trial. Current plans include completing a definitive feasibility study in 2013 with on-site construction slated for 2015. Avalon's plan calls for the construction of a hydrometallurgical plant at Pine Point for secondary processing. Rare earth concentrates will then be shipped to Louisiana, where concentrates will be processed to isolate and refine the heavy and light rare earth oxides and chlorides.

NICO, Fortune Minerals Ltd. Fortune Minerals discovered its 100 per cent owned NICO gold-cobalt-bismuth deposit in 1996. It has since spent more than \$100 million to delineate and engineer the deposit, located about 160 kilometres northwest of Yellowknife. The spending includes construction of a pilot test underground mine to verify the deposit's geometry and grade. The company is now in the environmental assessment process. It completed key public hearings in September.

Fortune Minerals proposes to build a fully integrated open-pit and underground mine as well as a mill at the NICO site, complemented by a hydrometallurgical refinery near Saskatoon to process concentrates from the mine mill. In July, the company released the results of a front-end engineering and design study. Among the highlights were an upgrade of proven and probable mineral reserves to 33 million tonnes at 1.02 grams per tonne gold, resulting in a 12% increase in grade.


Pine Point, Tamerlane Ventures Inc. Located 40 kilometres east of Hay River, Pine Point is the site of a former lead-zinc mine that operated between 1964 and 1984. Tamerlane is proposing to build a new mine on the site, focused on the R-190 Project, which includes the R-190 deposit and five other underground deposits.

Underground proven and probably re-

serves at the R-190 Project are estimated at 7.8 million tonnes grading at 3.01% lead and 6.16% zinc. Earlier this year, Tamerlane also released the results of a technical report on its N-204 open-pit plan, with estimated diluted probable reserves at 12.8 million tonnes grading at 0.7% lead and 2.6% zinc.

Prairie Creek, Canadian Zinc Corp. This project is located in the south Mackenzie Mountains about 100 kilometres northeast of the community of Nahanni Butte. Canadian

Zinc is proposing to build an underground mine at the site, based on a vein deposit and stratabound mineralization containing proven and probable reserves estimated at 5.2 million tonnes of ore grading at 9.4% zinc, 9.5% lead 151 grams per tonne of silver.

The project has cleared its environmental assessment under the Mackenzie Valley Review Board and is now in the regulatory permitting process under the Mackenzie Valley Land and Water Board. 



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nunavutupdate

CONTINUED FROM PAGE 30.

In the Kivalliq region, Agnico-Eagle Mines Ltd. controls both the Meadowbank gold mine (discussed below) and the Meliadine gold project. Work at Meliadine in 2012 focused an exploration budget of \$40 million on 90,000 metres of resource conversion drilling and 55,000 metres of exploration drilling. An additional budget of \$52 million was allocated to infrastructure upgrades, permitting and feasibility studies. These upgrades include a 24-kilometre all-weather access road from Rankin Inlet to the site, which received approval and began construction this year. Gold exploration in the Kivalliq region was also carried out by Anconia Resources Corp. at its Marce project, Northquest Ltd. at Pistol Bay and Prosperity Goldfields Corp. at Kiyuk.

BASE METALS

Four companies were exploring for base metals in Nunavut this year. In the Kitikmeot region, MMG Resources Inc. conducted resource definition drilling at its copper-zinc High Lake and Izok Lake volcanogenic massive sulphide deposits, as well as exploration at its Hood River project. Earlier this year MMG announced its intention to proceed with the Izok Lake Corridor project, which would involve open-pit mines at both High Lake and Izok Lake and a 350 kilometre-long road linking the mines to a port to be constructed at Grays Bay on the Coronation Gulf. Also in the Kitikmeot region this year, Xstrata Zinc Canada conducted its first exploration program at the Hackett River silver-zinc-copper project since acquiring the property from Sabina Gold & Silver in 2011.

On the Melville Peninsula in the Qikiqtaaluk region, Vale Canada Ltd. continued exploration for nickel at its Melville Permits project; work this year included surface exploration and ground geophysics. Aston Bay Ventures completed work at the Seal zinc-silver and Storm copper properties, both located on Somerset Island in the High Arctic and optioned from Commander Resources.

URANIUM

Three main properties are being explored for uranium in the Kivalliq region. Efforts this year at all three properties focused on diamond drilling and ground geophysics to define additional resources and identify new ex-

ploration targets. In 2012, AREVA Resources Canada Inc. submitted a revised draft environmental impact statement to the Nunavut Impact Review Board for the Kiggavik-Sissons project, where work by the company has continued since 2006. Additional drilling and testing of targets was carried out on the property, located approximately 80 kilometres west of Baker Lake. Construction of a mine could begin as early as 2015, provided regulatory approval is granted, and mining could commence as early as 2019.

Immediately to the west, Cameco Corp. is exploring at its Aberdeen and Turqavik projects in the Thelon Basin. The company has established a new camp facility on the south shore of Aberdeen Lake. With an exploration budget of \$9 million for 2012, the focus has been on conducting ground geophysics and drill-testing additional resource targets.

Kivalliq Energy continued work on the Angilak project. Early in the year the company issued a NI 43-101 compliant resource estimate of 1.78 million tonnes grading 0.69% U_3O_8 for a total of 27.13 million pounds U_3O_8 as an inferred resource at the Lac Cinquante deposit. More than 27,000 metres of drill core from 129 holes and 4,990 metres of drilling in 36 exploratory reverse-circulation drill holes was completed in 2012. These defined significant resource additions to the deposit with the discovery of western and eastern extensions at the J4, Ray and Pulse zones.

DIAMONDS

In December 2011, BHP Billiton sold its 51 per cent share in the Chidliak diamond project to then-partner Peregrine Diamonds Ltd., allowing Peregrine to consolidate control of the project. A \$10.5-million exploration program was initiated in 2012, which involved 720 line-kilometres of ground magnetic surveying, as well as prospecting, geological mapping and kimberlite indicator mineral sampling.

New targets and occurrences of kimberlite float were identified as a result of this work and two new kimberlites were discovered, bringing the total to 61 at Chidliak. More than 2,300 metres of definition core drilling was added to three key kimberlite pipes in preparation for bulk sampling, planned for 2013. Recently, Peregrine Diamonds Ltd. announced a new option and subscription agreement with De Beers Canada Inc., which sets the stage for De Beers

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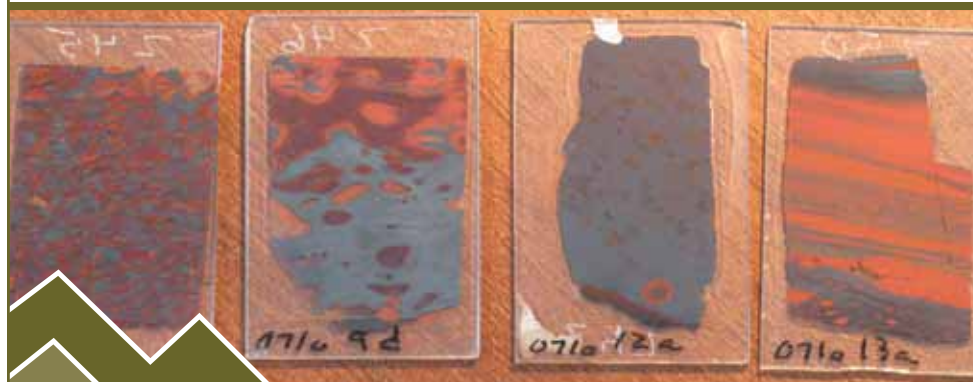
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nunavutupdate

CONTINUED FROM PAGE 55.

to enter into a joint-venture agreement for the Chidliak diamond project.

Shear Diamonds Ltd. continued its work at the Jericho diamond mine. The focus of work this year was the processing of reject concentrate stockpiles left behind by the previous operator. The company delivered more than 47,500 carats from this program to its diamond marketing partner, Taché Company N.V., before suspending production due to weakening diamond prices.


PRODUCTION

With the opening of Agnico-Eagle's Meadowbank gold mine, north of Baker Lake, in 2010, Nunavut returned to being a mineral producer. Early in 2012, the company announced that mine life was shortened with closure expected in 2017. The upward trend of production costs in the first quarter was followed, however, by encouraging results of cost control measures which resulted in lower costs for the second quarter.

For the first six months of 2012, the mine produced 177,804 troy ounces of gold at a total cost of \$901 per ounce. In only its third year of production, together with Agnico-Eagle's advanced Meliadine gold property near Rankin Inlet, further resource growth suggests that the region will remain a viable gold producer for the coming years.

CONCLUSIONS

The mineral potential of Nunavut continues to grow as significant extensions of existing discoveries have been identified in 2012 and underexplored areas of unknown mineral potential remain. Several commodities are being explored for in Nunavut, and uranium, gold and iron projects are advancing through the regulatory process, indicating that mineral production in Nunavut will substantially increase in the coming years.

From coal beds on Ellesmere Island in the High Arctic to iron ore on the Belcher Islands in lower Hudson Bay, interest in Nunavut continues to be extensive. Exploration highlights for 2012 will be remembered for significant extensions and discoveries made to existing prospects. Exploration spending for 2013 is likely to remain strong and appears to be entering a sustained level as more projects move towards feasibility studies and through the regulatory process towards production. 

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CONTINUED FROM PAGE 44.

WHILE IT'S EASY TO SEE the economic benefits that derive from Northern mining – and they have been impressive – it's also important to remember the challenges companies and communities face in achieving them. The arrival of a mine does not mean that benefits flow like water from a tap. The opportunities have to be nurtured.

"We set the stage by communicating with the communities," says Graeme Dargo, superintendent for community engagement with Agnico-Eagle. "We say, 'Here's what we need to run a mine.' And we take an inventory of what skills are available locally." Once the company has an idea of local skills, they can help build them. For example, Agnico-Eagle might find a local company skilled in residential mechanical housing, partner with it, and upgrade its skills to address a mine's industrial needs.

"Right now at Agnico-Eagle, our workforce is about 35 percent Inuit. We ask, 'Why isn't it higher?'" Dargo says. "So we have 12 full-time trainers and offer one-on-one training in trades, designed to encourage upward mobility. But we can't say we have it all figured out." Some trained employees will inevitably leave the mine, possibly to strike out on their own, identify opportunities and fill economic niches. "The biggest incentive to entrepreneurship is a paycheck," Dargo says. "It creates a local economy in which businesses are enjoying healthy sales."

And the opportunities are there – even with the end of mine life at major projects like Ekati and Diavik starting to come into view. There are currently eight resource projects in Nunavut and six projects in the NWT that have the potential to become full-fledged mines. Estimates from the NWT and Nunavut Chamber of Mines put spending on mine construction peaking at \$2.5 billion over the next five years and settling \$1.5 billion annually for the following 10 to 15 years. "That's the size of the opportunity," says the chamber's Tom Hoefer. "How much of that can we get to stick in the North?"

That's an important question. But there are reasons to be optimistic about the outcome. The business capacity of the North has grown exponentially over the last two decades – and credit for that goes to a collaborative effort between mining companies, Northern business, government and Northern communities to leverage their economic opportunities. As long as this approach continues – along with the energy with which it has been embraced – a new generation of opportunity could very well be on the horizon. 

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What's Up With Junior?

It's a long road from early exploration to development. And the chances of finding an actual mine are pretty slim, about 1,000 to one. Still, even early-stage exploration plays have stories to tell – and maybe even a glimpse of the future.

Three Bluffs Project

North Country Gold Corp.

Where is it? Three Bluffs lies north of Baker Lake in Nunavut's Kivalliq region. It's about 180 kilometres north of Agnico-Eagle Inc.'s Meadowbank gold mine.

What is it? North Country Gold holds a 100 per cent interest in 530,000 acres that run along a greenstone belt. The belt contains five distinct mineral centres, including the Three Bluffs deposit.

What makes it interesting? The Three Bluffs deposit is located in one of Canada's largest unexplored greenstone belts. Its geological composition is comparable to that of Agnico-Eagle's Meadowbank and Meliadine deposits. Current estimates put the indicated resource for Three Bluffs at 4.3 million tonnes, grading at 4.9 grams per tonne for 678,000 ounces of gold. Inferred resources are estimated at 4.5 million tonnes at 5.69 grams tonne.

Lac Cinqante

Kivalliq Energy Corp.

Where is it? Lac Cinquante is part of Kivalliq Energy Corp.'s 253,000-acre flagship Angilak Project, located in the Kivalliq region of Nunavut, approximately 300 kilometres west of Rankin Inlet.

What Is It? A high-grade uranium deposit. According to Kivalliq Energy, Lac Cinquante hosts an inferred resource of 27.13 million pounds in 1.78 million tonnes averaging 0.69% U3O8. In addition to Lac Cinquante, the Angilak Project hosts several high priority zones that were included in Kivalliq Energy's 2012 exploration program.

What Makes It Interesting? Lac Cinquante is the highest grade uranium deposit in Canada outside of the Athabasca Basin. Kivalliq Energy is also the first company to earn the right to explore for uranium on Inuit-owned lands under the Nunavut land claim. The Angilik project is subject to a comprehensive agreement between Kivalliq Energy and Nunavut Tungavik Inc., the organization that governs the claim. Kivalliq Energy also received the 2012 Environment Achievement award from the Kivalliq Inuit Association for stewardship of the project.

Coates Lake

Copper North Mining Corp.

Where is it? Coates Lake is part of Copper North's Redstone property in the western NWT, about 290 kilometres south of Norman Wells.

What is it? Coates Lake is a copper deposit located in the southeastern portion of the Redstone property. Copper North's summer exploration program for Redstone was comprised of geological mapping, ground geophysics and geochemical sampling focused on several areas, including Coates Lake.

What makes it interesting? Redstone was extensively drilled between 1960 and 1980. Historic estimates put the resource in the Coates Lake area at 36.8 million short tons (a short ton equals 2,000 pounds), grading at 3.92% copper and 0.33 ounces per ton for silver. Copper North, however, is not treating these historic estimates as current.

Wrigley Property

Devonian Metals Inc.

Where is it? The Wrigley property is located in the NWT's Deh Cho region on the southwest side of the Mackenzie River, across from the community of Wrigley.

What is it? Devonian Minerals is conducting lead-zinc exploration on 1,100 hectares covered in two mining leases. The deposits were originally discovered in 1972 by Cominco and were then subject to two years of prospecting, geological mapping, geophysics and drilling. Cominco estimated the property hosted a “10,000,000 ton potential maximum in presently indicated structures,” although these figures cannot be considered a “mineral resource.”

What makes it interesting? After the merger of Cominco and Teck, the Wrigley Property was eventually sold. Devonian bought it outright in 2003. But the sale by Teck, as the merged company became known, did not suggest it saw no value. The fact that the claims were converted to mining leases in 1985 suggests it saw promise but that the potential did not fit with overall global corporate strategy. **M**



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◁ᄇᆞᆯ▷ᄃᆞᆫᄂᆞᆫᄃᆞᆫᄅᆞᆫᄇᆞᆫᄈᆞᆫᄉᆞᆫᄊᆞᆫᄋᆞᆫᄌᆞᆫᄍᆞᆫᄎᆞᆫᄏᆞᆫᄐᆞᆫᄑᆞᆫᄒᆞᆫᄓᆞᆫᄔᆞᆫᄕᆞᆫᄜᆞᆫᄝᆞᆫᄞᆞᆫᄟᆞᆫᄠᆞᆫᄡᆞᆫᄢᆞᆫᄣᆞᆫᄤᆞᆫᄥᆞᆫᄦᆞᆫᄧᆞᆫᄨᆞᆫᄩᆞᆫᄪᆞᆫᄫᆞᆫᄬᆞᆫᄭᆞᆫᄮᆞᆫᄯᆞᆫᄰᆞᆫᄱᆞᆫᄲᆞᆫᄳᆞᆫᄴᆞᆫᄵᆞᆫᄶᆞᆫᄷᆞᆫᄸᆞᆫᄹᆞᆫᄺᆞᆫᄻᆞᆫᄼᆞᆫᄽᆞᆫᄾᆞᆫᄿᆞᆫᅀᆞᆫᅁᆞᆫᅂᆞᆫᅃᆞᆫᅄᆞᆫᅅᆞᆫᅆᆞᆫᅇᆞᆫᅈᆞᆫᅉᆞᆫᅊᆞᆫᅋᆞᆫᅌᆞᆫᅍᆞᆫᅎᆞᆫᅏᆞᆫᅐᆞᆫᅑᆞᆫᅒᆞᆫᅓᆞᆫᅔᆞᆫᅕᆞᆫᅖᆞᆫᅗᆞᆫᅘᆞᆫᅙᆞᆫᅚᆞᆫᅛᆞᆫᅜᆞᆫᅝᆞᆫᅞᆞᆫᅟᆞᆫᅠᆞᆫᅡᆞᆫᅢᆞᆫᅣᆞᆫᅤᆞᆫᅥᆞᆫᅦᆞᆫᅧᆞᆫᅨᆞᆫᅩᆞᆫᅪᆞᆫᅫᆞᆫᅬᆞᆫᅭᆞᆫᅮᆞᆫᅯᆞᆫᅰᆞᆫᅱᆞᆫᅲᆞᆫᅳᆞᆫᅴᆞᆫᅵᆞᆫᅶᆞᆫᅷᆞᆫᅸᆞᆫᅹᆞᆫᆀᆞᆫᆁᆞᆫᆂᆞᆫᆃᆞᆫᆄᆞᆫᆅᆞᆫᆆᆞᆫᆇᆞᆫᆈᆞᆫᆉᆞᆫᆊᆞᆫᆋᆞᆫᆌᆞᆫᆍᆞᆫᆎᆞᆫᆏᆞᆫᆐᆞᆫᆑᆞᆫᆒᆞᆫᆓᆞᆫᆔᆞᆫᆕᆞᆫᆖᆞᆫᆗᆞᆫᆘᆞᆫᆙᆞᆫᆚᆞᆫᆛᆞᆫᆜᆞᆫᆝᆞᆫᆞᆞᆫᆟᆞᆫᆠᆞᆫᆡᆞᆫᆢᆞᆫᆣᆞᆫᆤᆞᆫᆥᆞᆫᆦᆞᆫᆧᆞᆫᆨᆞᆫᆩᆞᆫᆪᆞᆫᆫᆞᆫᆬᆞᆫᆭᆞᆫᆮᆞᆫᆯᆞᆫᆰᆞᆫᆱᆞᆫᆲᆞᆫᆳᆞᆫᆴᆞᆫᆵᆞᆫᆶᆞᆫᆷᆞᆫᆸᆞᆫᆹᆞᆫᆺᆞᆫᆻᆞᆫᆼᆞᆫᆽᆞᆫᆾᆞᆫᆿᆞᆫᇀᆞᆫᇁᆞᆫᇂᆞᆫᇃᆞᆫᇄᆞᆫᇅᆞᆫᇆᆞᆫᇇᆞᆫᇈᆞᆫᇉᆞᆫᇊᆞᆫᇋᆞᆫᇌᆞᆫᇍᆞᆫᇎᆞᆫᇏᆞᆫᇐᆞᆫᇑᆞᆫᇒᆞᆫᇓᆞᆫᇔᆞᆫᇕᆞᆫᇖᆞᆫᇗᆞᆫᇘᆞᆫᇙᆞᆫᇚᆞᆫᇛᆞᆫᇜᆞᆫᇝᆞᆫᇞᆞᆫᇟᆞᆫᇠᆞᆫᇡᆞᆫᇢᆞᆫᇣᆞᆫᇤᆞᆫᇥᆞᆫᇦᆞᆫᇧᆞᆫᇨᆞᆫᇩᆞᆫᇪᆞᆫᇫᆞᆫᇬᆞᆫᇭᆞᆫᇮᆞᆫᇯᆞᆫᇰᆞᆫᇱᆞᆫᇲᆞᆫᇳᆞᆫᇴᆞᆫᇵᆞᆫᇶᆞᆫᇷᆞᆫᇸᆞᆫᇹᆞᆫᇺᆞᆫᇻᆞᆫᇼᆞᆫᇽᆞᆫᇾᆞᆫᇿᆞᆫᏀᆞᆫᏁᆞᆫᏂᆞᆫᏃᆞᆫᏄᆞᆫᏅᆞᆫᏆᆞᆫᏇᆞᆫᏈᆞᆫᏉᆞᆫᏊᆞᆫᏋᆞᆫᏌᆞᆫᏍᆞᆫᏎᆞᆫᏏᆞᆫᏐᆞᆫᏑᆞᆫᏒᆞᆫᏓᆞᆫᏔᆞᆫᏕᆞᆫᏖᆞᆫᏗᆞᆫᏘᆞᆫᏙᆞᆫᏚᆞᆫᏛᆞᆫᏜᆞᆫᏝᆞᆫᏞᆞᆫᏟᆞᆫᏠᆞᆫᏡᆞᆫᏢᆞᆫᏣᆞᆫᏤᆞᆫᏥᆞᆫᏦᆞᆫᏧᆞᆫᏨᆞᆫᏩᆞᆫᏪᆞᆫᏫᆞᆫᏬᆞᆫᏭᆞᆫᏮᆞᆫᏯᆞᆫᏰᆞᆫᏱᆞᆫᏲᆞᆫᏳᆞᆫᏴᆞᆫᏵᆞᆫ᏶ᆞᆫ᏷ᆞᆫᏸᆞᆫᏹᆞᆫᏺᆞᆫᏻᆞᆫᏼᆞᆫᏽᆞᆫ᏾ᆞᆫ᏿ᆞᆫ᐀ᆞᆫᐁᆞᆫᐂᆞᆫᐃᆞᆫᐄᆞᆫᐅᆞᆫᐆᆞᆫᐇᆞᆫᐈᆞᆫᐉᆞᆫᐊᆞᆫᐋᆞᆫᐌᆞᆫᐍᆞᆫᐎᆞᆫᐏᆞᆫᐐᆞᆫᐑᆞᆫᐒᆞᆫᐓᆞᆫᐔᆞᆫᐕᆞᆫᐖᆞᆫᐗᆞᆫᐘᆞᆫᐙᆞᆫᐚᆞᆫᐛᆞᆫᐜᆞᆫᐝᆞᆫᐞᆞᆫᐟᆞᆫᐠᆞᆫᐡᆞᆫᐢᆞᆫᐣᆞᆫᐤᆞᆫᐥᆞᆫᐦᆞᆫᐧᆞᆫᐨᆞᆫᐩᆞᆫᐪᆞᆫᐫᆞᆫᐬᆞᆫᐭᆞᆫᐮᆞᆫᐯᆞᆫᐰᆞᆫᐱᆞᆫᐲᆞᆫᐳᆞᆫᐴᆞᆫᐵᆞᆫᐶᆞᆫᐷᆞᆫᐸᆞᆫᐹᆞᆫᐺᆞᆫᐻᆞᆫᐼᆞᆫᐽᆞᆫᐾᆞᆫᐿᆞᆫᑀᆞᆫᑁᆞᆫᑂᆞᆫᑃᆞᆫᑄᆞᆫᑅᆞᆫᑆᆞᆫᑇᆞᆫᑈᆞᆫᑉᆞᆫᑊᆞᆫᑋᆞᆫᑌᆞᆫᑍᆞᆫᑎᆞᆫᑏᆞᆫᑐᆞᆫᑑᆞᆫᑒᆞᆫᑓᆞᆫᑔᆞᆫᑕᆞᆫᑖᆞᆫᑗᆞᆫᑘᆞᆫᑙᆞᆫᑚᆞᆫᑛᆞᆫᑜᆞᆫᑝᆞᆫᑞᆞᆫᑟᆞᆫᑠᆞᆫᑡᆞᆫᑢᆞᆫᑣᆞᆫᑤᆞᆫᑥᆞᆫᑦᆞᆫᑧᆞᆫᑨᆞᆫᑩᆞᆫᑪᆞᆫᑫᆞᆫᑬᆞᆫᑭᆞᆫᑮᆞᆫᑯᆞᆫᑰᆞᆫᑱᆞᆫᑲᆞᆫᑳᆞᆫᑴᆞᆫᑵᆞᆫᑶᆞᆫᑷᆞᆫᑸᆞᆫᑹᆞᆫᑺᆞᆫᑻᆞᆫᑼᆞᆫᑽᆞᆫᑾᆞᆫᑿᆞᆫᒀᆞᆫᒁᆞᆫᒂᆞᆫᒃᆞᆫᒄᆞᆫᒅᆞᆫᒆᆞᆫᒇᆞᆫᒈᆞᆫᒉᆞᆫᒊᆞᆫᒋᆞᆫᒌᆞᆫᒍᆞᆫᒎᆞᆫᒏᆞᆫᒐᆞᆫᒑᆞᆫᒒᆞᆫᒓ

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